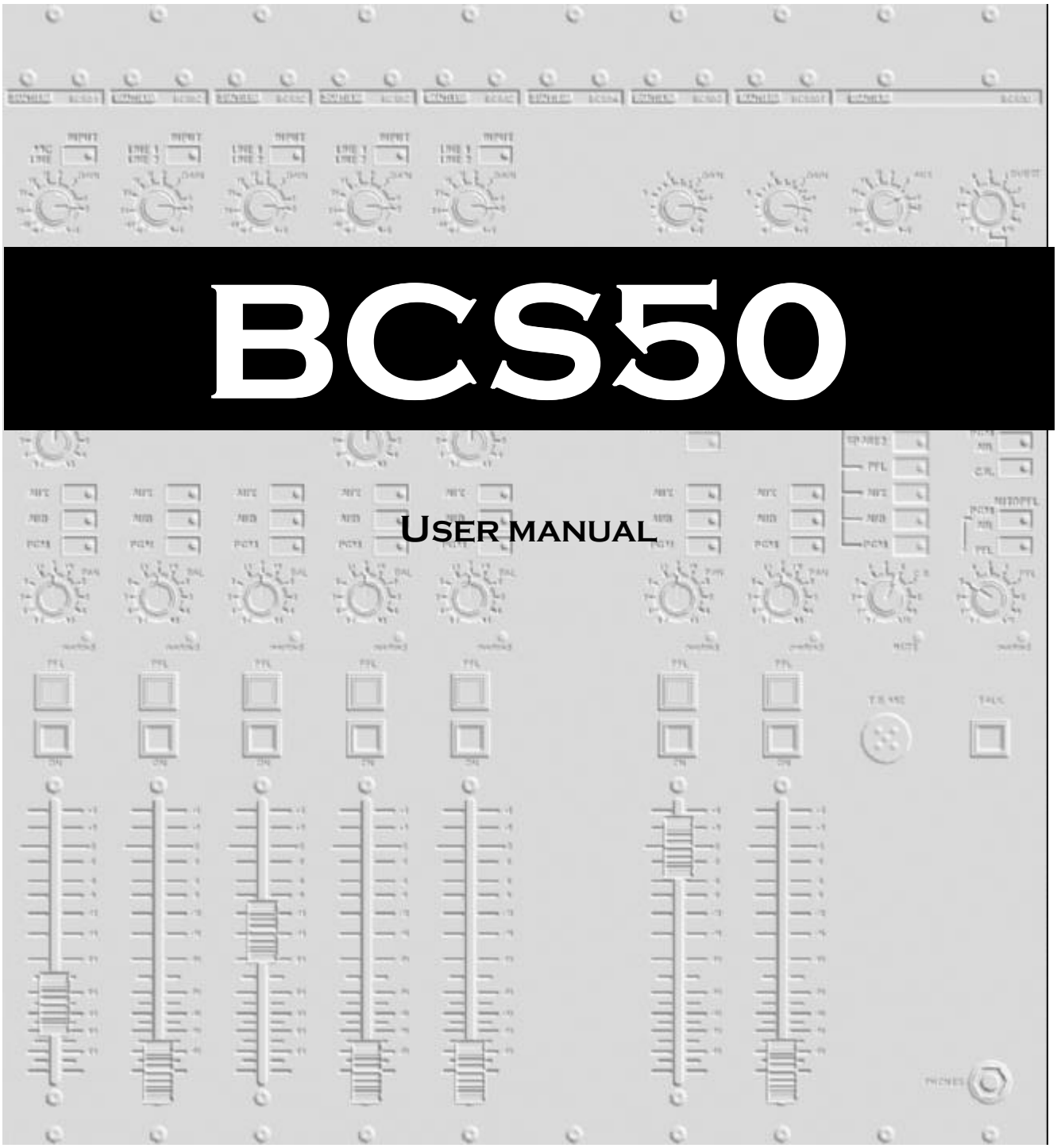


# BCS50

## User manual

DATEQ
audio technologies

## Safety instructions

**1** All safety instructions, warnings and operating instructions must be read first.

**2** All warnings on the equipment must be heeded.

**3** The operating instructions must be followed.

**4** Keep the operating instructions for future reference.

**5** The equipment may never be used in the immediate vicinity of water; make sure that water and damp cannot get into the equipment.

**6** The equipment may only be installed or fitted in accordance with the manufacturers recommendations.

**7** The equipment must be installed or fitted such that good ventilation is not obstructed in any way.

**8** The equipment may never be installed in the immediate vicinity of sources of heat, such as parts of heating units, boilers, and other equipment which generates heat (including amplifiers).

**9** Connect the equipment to a power supply of the correct voltage, using only the cables recommended by the manufacturer, as specified in the operating instructions and/or shown on the connection side of the equipment.

**10** The equipment may only be connected to a legally approved earthened mains power supply.

**11** The power cable or power cord must be positioned such that it cannot be walked on in normal use, and objects which might damage the cable or cord cannot be placed on it or against it. Special attention must be paid to the point at which the cable is attached to the equipment and where the cable is connected to the power supply.

**12** Ensure that foreign objects and liquids cannot get into the equipment.

**13** The equipment must be cleaned using the method recommended by the manufacturer.

**14** If the equipment is not being used for a prolonged period, the power cable or power cord should be disconnected from the power supply.

**15** In all cases where there is a risk, following an incident, that the equipment could be unsafe, such as:

- if the power cable or power cord has been damaged
- if foreign objects or liquids (including water) have entered the equipment
- if the equipment has suffered a fall or the casing has been damaged
- if a change in the performance of the equipment is noticed

it must be checked by appropriately qualified technical staff.

**16** The user may not carry out any work on the equipment other than that specified in the operating instructions.

DATEQ audio technologies

# Introduction

The DATEQ BCS50 mixer-series is especially developed to be used in a broadcast-environment. The large number of built-in automations makes this mixer ideally suited in any self-supporting studio.

### Frame

The BCS50 mixer is a modular system existing of a frame, a master module and free to choose input-modules. The frame can contain up to 16 input modules and a master module. The power-supply is built into the frame.

### Input modules

A large number of input modules is available:

| Type number | Possible connections | | Connector type |
|---|---|---|---|
| BCS51 | MIC | Microphone | XLR-F |
| | LINE | Balanced mono line | XLR-F |
| BCS51E | | As BCS51, but with three-way tone control | |
| | | | |
| BCS52 | LINE 1 | Unbalanced stereo line (RIAA optional) | XLR-F |
| | LINE 2 | Unbalanced stereo line | XLR-F |
| BCS52E | | As BCS52, but with three-way tone control | |
| | | | |
| BCS52S | LINE 1 | Balanced stereo line | 2x 6.3mm jack |
| | LINE 2 | Balanced stereo line (RIAA optional) | 2x 6.3mm jack |
| BCS52SE | | As BCS52S, but with three-way tone control | |
| | | | |
| BCS52N | LINE 1 | Balanced stereo line | 2x XLR-F |
| | LINE 2 | Balanced stereo line | 2x 6.3mm jack |
| BCS52NE | | As BCS52S, but with three-way tone control | |
| | | | |
| BCS53 | | Telephone module with built-in analogue telephone hybrid | 1x XLR<br>1x XLR-M |
| | | | |
| BCS53T | | Telephone module to connect an external (digital) telephone hybrid | SUB-D-15 |

The position and the number of modules is variable. The only limitation is the number of analogue telephone hybrids that can be used simultaneously (maximum 2 or 3, depending on the quality of the subscriber line).

TIP When digital telephone hybrids are used more than 2 lines can be on the air simultaneously. This is because digital hybrids have a better trans-hybrid attenuation.

### Mastermodule

The BCS50 mastermodule has all the mix,- and output amplifiers and various volume-controls. This module is placed at the most right position in the frame.

### Meterbridges

The BCS50 meterbridge can house the following readouts:

- BCS121: DCF77 atomic-clock/ timer/ stopwatch
- Analogue moving-coil meter, or 2x 50 segment digital horizontal LED VU meter with peak indicator
- BCS68: dual 2x 30 segment digital vertical LED VU meter with peak indicator

**Outputs**

PGM (program) output

The PGM-output is the main-output of the mixer. All channels with the PGM-switch pushed feed their signal to the PGM-buss. The PGM-signal is available on three XLR-connectors: mono, left and right. All these outputs are electronically balanced. Besides these outputs the BCS50 has three unbalanced PGM-outputs on 6.3mm stereo jacks (PGM1/PGM2/PGM3). These connectors can be used link to other equipment located inside the studio, like amplifiers etc.

AUD (audition) output

All modules with the AUD-switch pressed will be audible on the AUD-output. The AUD-output can for example be used to connect to various recorders. The AUD-volume control on the master will adjust the overall audition-volume. The unbalanced AUD-output is available on a 6.3mm stereo jack.

AUX (auxiliary) output

The auxiliary output can be used for a director-link. All channels can feed their signal to the AUX-buss. With an internal PRE/POST-jumper the signals source can be switched to pre-fader (independent of the fader) or post-fader (signals volume is dependent of the fader). The master-modules AUX-volume controls the overall AUX-level. The unbalanced AUX-output is available on a 6.3mm stereo jack.

TIP The AUX-buss may also be used to connect effect-equipment. The effect-return signal can be inserted at any normal input-module. You will have to turn off the AUX-switch at this channel to prevent a feed-back!

CR (control room) output

At this output the amplifier for the technical-room can be connected. The selection switches on the master determine the signal-source that will be heard on this output. All sources can be monitored.

TIP This output can be muted automatically when a microphone in the technical-room is active to prevent an acoustical feedback.

STUDIO output

Connect the amplifier for the presentation-room here. This output can have the same signal as the CR output. It is also possible to switch to the AIR or the PGM signal.

ON-AIR 1 and 2 outputs

External ON-AIR indicators (like the DATEQ OA-1) can be connected to the ON-AIR-outputs. These two outputs are freely programmable with jumpers on the input modules. When ON-AIR1 is activated the studio output is muted. When all the microphones in the studio are switched to ON-AIR1 an acoustical feedback will be prevented!

ANNOUNCER

The announcers headphones can be connected here. When the technician pushes the TALK-button he will be audible on this output, otherwise the program signal or the CR signal (depending on the CR-switch on the master) can be heard.

GUEST

The guests headphones can be connected here. This output contains the PGM-signal, except when the PGM/TALKBACK switch on the master is pressed; then the output has the same signal as the ANNOUNCER-output. The guests will also hear the technician when he presses the TALK-button.

TIP By switching the PGM/TALKBACK to PGM the guests will not become confused when the technician uses the TALK button.

**Inputs**

AIR/ SPARE1/ SPARE2 inputs

The AIR signal is to be used to connect the program-signal after it has gone all the way from the studio to the listener, for example with a tuner. At the SPARE inputs the processed studio signal can be returned, or the signal of a secondary studio can be connected. Keep in mind that these inputs are not electronically isolated.

TIP When using a tuner connected to a cable-network earth-loops are created. To prevent earth-loops an isolation-transformer can be used in the audio-wires, or at the RF-connector.

TALKBACK IN

The external talkback-input can be used to connect a (to line-level amplified) director-microphone. When the contact is made this microphone is routed to the PFL-buss, and the CR signal will automatically switch to PFL, so that everyone listening to the CR will hear the director. When the announcer must hear the director, the CR-switch on the master has to be pressed.

POWER

Mains input (115 or 230 VAC; internally selectable, 100 Watts).

DCF-ANT

Input for the active aerial supplied with the BCS121 clock-timer.

## Product support

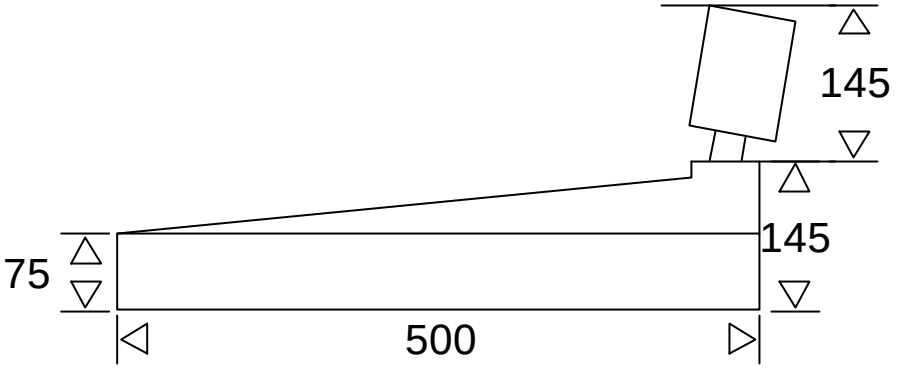
When you have any questions about the BCS50, or other DATEQ products please contact:

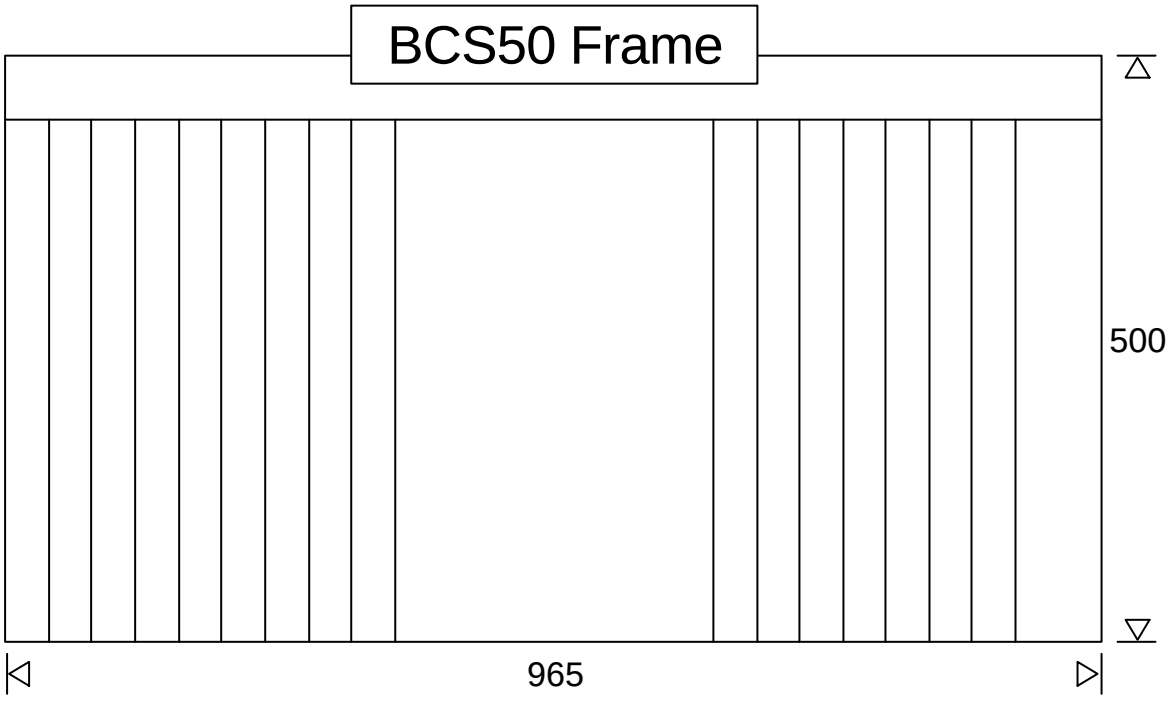
**Dateq Audio Technologies B.V.**
De Paal 37
1351 JG Almere
The Netherlands

Telephone: +31 36 54 72 222
Fax: +31 36 53 17 776
E-mail: info@dateq.nl
Internet: www.dateq.nl

## Mounting

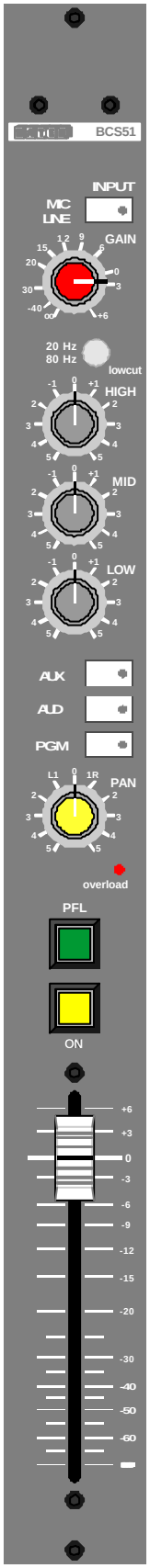
The BCS50 frame will fit into an opening of 965 x 500 x 75mm (W x L x D). See the drawings below.



# BCS51 Microphone/ mono line module

To a BCS51 module a microphone and a balanced mono line-source can be connected. The module has the possibility to supply the microphone with a phantompower (48V), this makes it possible to use condenser microphones. There are BCS51 modules with (BCS51E) and without three-way tone control (BCS51).




**MIC/ LINE** Input selector. When the switch is pressed the line-input is activated and the LED illuminates.

**GAIN** Combined input-sensitivity control.

**LOWCUT** Switches the crossover frequency of the high-pass filter between 20 and 80Hz.

**HIGH** High tone control. (BCS51E)

**MID** Middle tone control. (BCS51E)

**LOW** Low tone control. (BCS51E)

**AUX** Routes the signal to the AUX-buss.
**AUD** Routes the signal to the AUD-buss.
**PGM** Routes the signal to the PGM-buss.

**PAN** Panorama control. Places the mono-sound in the stereo image.

**OVERL.** This LED illuminates when the signal in the module is too high, and in danger of becoming distorted.

**PFL** Pre-Fader Listening. By pressing this switch the signal will be audible on the head-phones.

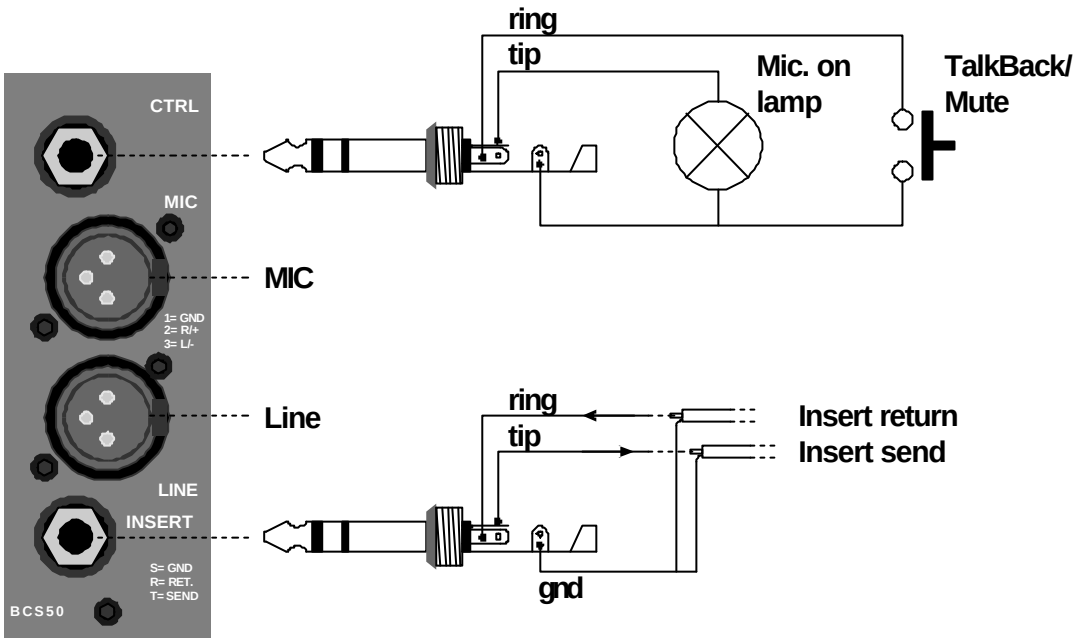
**ON** Switch to activate the module. When the ON-lamp lights up the signal can be heard on the selected busses (AUX, AUD, PGM). When faderstart is configured the lamp will automatically light up when the fader is opened.
When the module is activated the PFL function will reset.

**FADER** With the fader the signal-level can be controlled. The nominal level is 0dB.

## Connecting the BCS51(E)

At the BCS51(E) connectorboard four connectors can be found:

| Name | Type | In/ Out | Description |
|---|---|---|---|
| CTRL | 6.3mm stereo jack | In & Out | 'Microphone on' indicator and cough-talkback button |
| MIC | XLR-F | In | Microphone input |
| LINE | XLR-F | In | Line input |
| INSERT | 6.3mm stereo jack | In & Out | Insert: possibility to connect effect-equipment (delays, echo etc.) |




## Technical description

**CTRL** Talkback logical input: 15V, 100kOhm; pulldown. Lamp power: 12Vdc, 1W max

This connector has two functions: connection a module-on indicator (for example a little lamp near to the active microphone) and a logical input for a cough-button. When the microphone is active and the button is pressed the microphone will be muted immediately. At the same time the module will switch to PFL, so that the microphone can be heard by the technician. These functions are only available when the microphone-input is active.

**MIC** Input level: -60 ... -14 dBm, Impedance: 300 Ohm

Microphone input. With an internal jumper the phantompower can de enabled or disabled. When the phantompower is switched on condenser microphones can be used. By default the phantompower is switched on. When no condenser microphone is used it is better to disable the phantompower.

**LINE** Input level: -14 ... +26 dBm, Impedance: 10 kOhm

Balanced mono line-input. This can be used for a (mono) location-receiver. When equipment with unbalanced outputs are being used the signal must be applied to pin 2(+). Pin 1(gnd) and pin 3(-) must be connected to ground.

**INSERT** Level: 0dBm, Impedance 10 kOhm

Effect equipment, like compressors or delays, can be connected to the insert in,- and output. The effect equipment is active on the microphone and on the line-input.

### LowCut

The built-in LowCut crossover frequency is switchable between 20Hz and 80Hz. The filters slope is 12dB/octave. This filter is to prevent annoying blobs from a microphone.

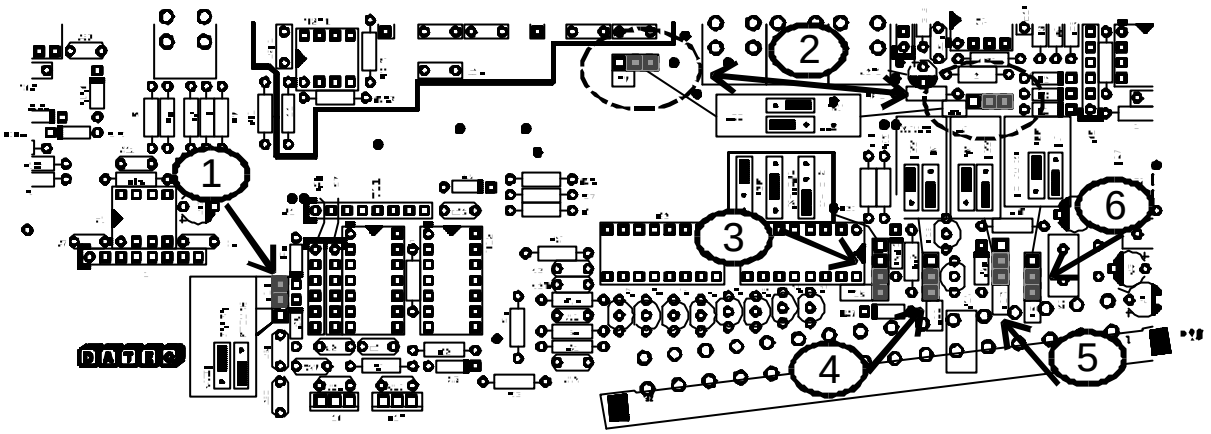
### Tone control

Tone control is only available on a BCS51E module. The crossover frequencies are:

HIGH: +/-12dB shelving @ 12 kHz
MID: +/- 12dB bell @ 1.5 kHz
LOW: +/- 16dB shelving @ 60 Hz

### Jumper settings

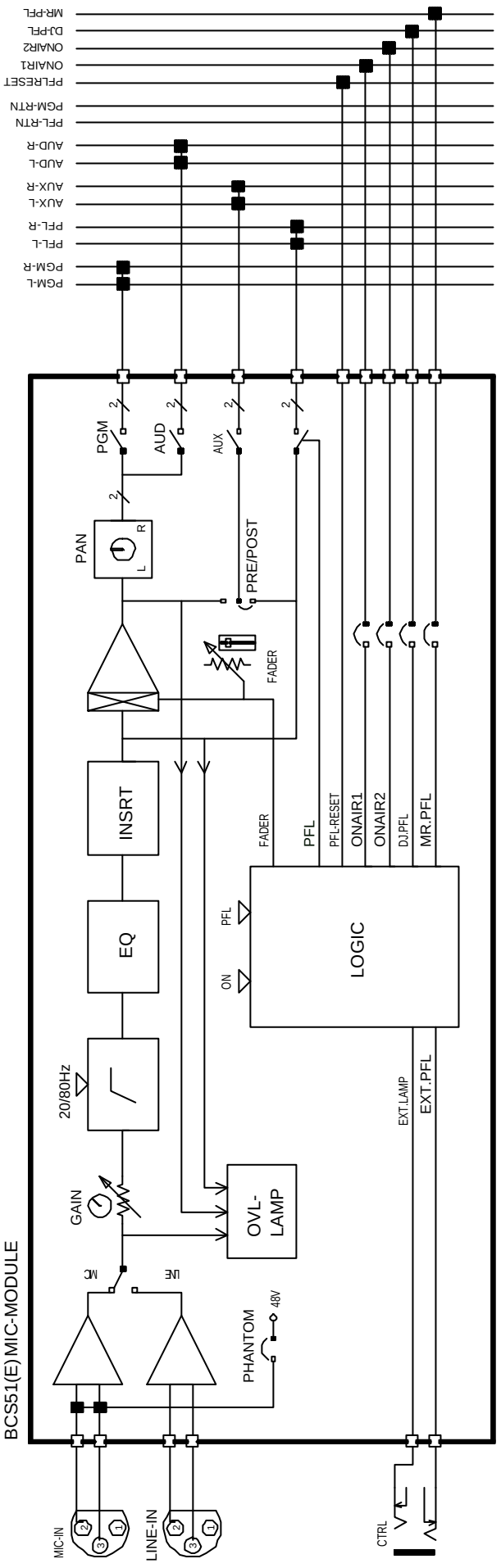
With the internal jumpers various settings/ automations can be enabled or disabled. The drawing below shows a PCB with the jumpers marked grey. In the table the functions are described.




| Jumper name | Possibilities | Description |
|---|---|---|
| CUE (1) | FADER (D) | The channel is activated when the fader is opened. |
| | SWITCH | The channel is activated when the ON-key is pressed. When the fader is opened and the ON-lamp does not light up no audio will be fed through. |
| AUX (2) | POST (D) | The after-fader signal is routed to the AUX-buss. Both jumpers (P6 and P7) have to be in the same position! |
| | PRE | The pre-fader signal is routed to the AUX-buss. Both jumpers (P6 and P7) have to be in the same position! |
| ON-AIR (3) | OFF | No ON-AIR outputs will be activated when the channel is switched on. |
| | ON-AIR1 (D) | When the channel is switched on ON-AIR1 will be activated. The studio output will be muted to prevent an acoustical feedback. |
| | ON-AIR2 | When the channel is switched on ON-AIR2 will be activated. |
| MSTR (4) | ON (D) | When the PFL-switch is pressed the CR will switch automatically to PFL. This makes the signal directly audible for the technician. |
| | OFF | The signal is mixed to the PFL-buss, but the CR-selector will not automatically switch to PFL. |
| DJ (5) | ON | When the module is activated all PFL-buttons will reset and the CR output will be muted to prevent an acoustical feedback with the DJ-microphone. It is also possible to let the CR-selector switch to AIR or PGM. This will be explained on page 29. |
| | OFF (D) | This function is disabled. |
| PHANTOM (6) | ON (D) | The phantompower (48V) is applied to the microphone-input. This is necessary when using condenser microphones. Check your microphones manual for more details. |
| | OFF | The phantompower is disabled. |

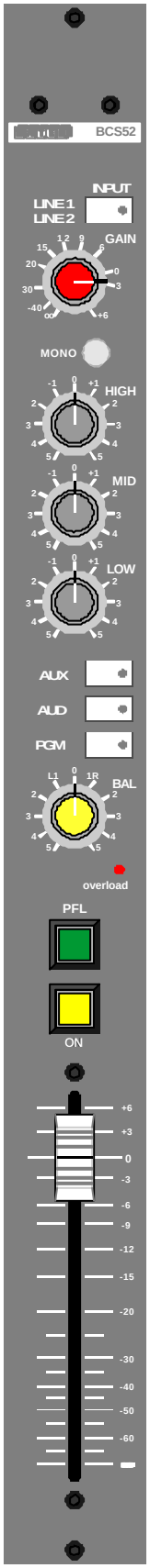
(D) indicates the default setting

## Blockdiagram BCS51(E)



# BCS52 dual stereo line module

To a BCS52 module two stereo line-sources can be connected. BCS modules are available with (BCS52E) and without three way tone control (BCS52). A normal BCS52(E) module has two unbalanced stereo line inputs. BCS52S(E) and BCS52N(E) modules have two balanced stereo line inputs.




**LINE 1/ LINE 2** Input source selector. When the switch is pressed line2 will be activated and the LED will be illuminated.

**GAIN** Combined input-sensitivity control.

**MONO** When the switch is pressed the left and the right signal will be combined to a mono format.

**HIGH** High tone control. (BCS52E, BCS52SE, BCS52NE)

**MID** Mid tone control. (BCS52E, BCS52SE, BCS52NE)

**LOW** Low tone control. (BCS52E, BCS52SE, BCS52NE)

**AUX** Routes the signal to the AUX-buss.
**AUD** Routes the signal to the AUD-buss.
**PGM** Routes the signal to the PGM-buss.

**BAL** Balance control. Determines the left/ right ratio of the signal.

**OVERL.** This LED illuminates when the signal in the module is too high, and in danger of becoming distorted.

**PFL** Pre-Fader Listening. By pressing this switch the signal will be audible on the head-phones.

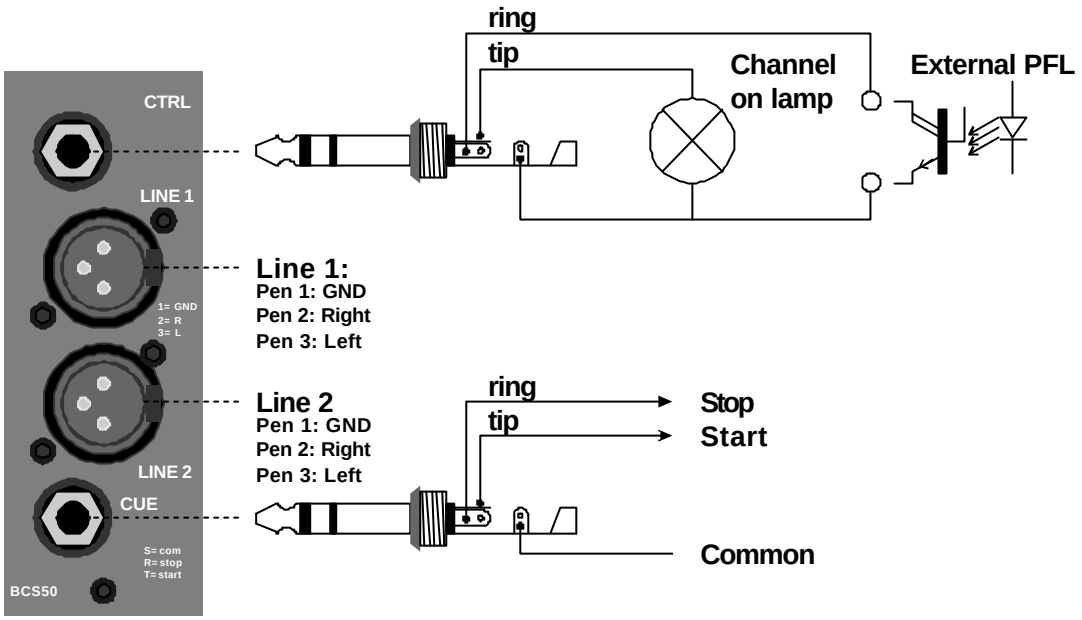
**ON** Switch to activate the module. When the ON-lamp lights up the signal can be heard on the selected busses (AUX, AUD, PGM). When faderstart is configured the lamp will automatically light up when the fader is opened.
When the module is activated the PFL function will reset.

**FADER** With the fader the signal-level can be controlled. The nominal level is 0dB.

## Connecting the BCS52(E)

At the BCS52(E) connectorboard four connectors can be found:

| Name | Type | In/ Out | Description |
|---|---|---|---|
| CTRL | 6.3mm stereo jack | In & Out | Channel on indicator and PFL input |
| LINE 1 | XLR-F | In | Stereo line 1 input |
| LINE 2 | XLR-F | In | Stereo line 2 input |
| CUE | 6.3mm stereo jack | Out | Start/ stop output |




## Technical description

**CTRL** Ext. PFL logical input: 15V, 100kOhm; pulldown. Lamp power: 12Vdc, 1W max

This connector has two functions: connecting an external module-on indicator and a logical input for an external PFL switch. When this input is pulled low (with an opto-coupler for example) the channel will switch the PFL on. These functions are only available when line 1 is active.

TIP With the external PFL it is possible to switch the channel to PFL automatically when the PLAY-button of the connected device is pressed. The device can be started with the start-output when the module is activated.

**LINE 1/ LINE2** Input level: -14 ... +20 dBm, Impedance: 10 kOhm

Connection for unbalanced stereo line inputs. With an optional RIAA add-on PCB it is possible to connect a record player.

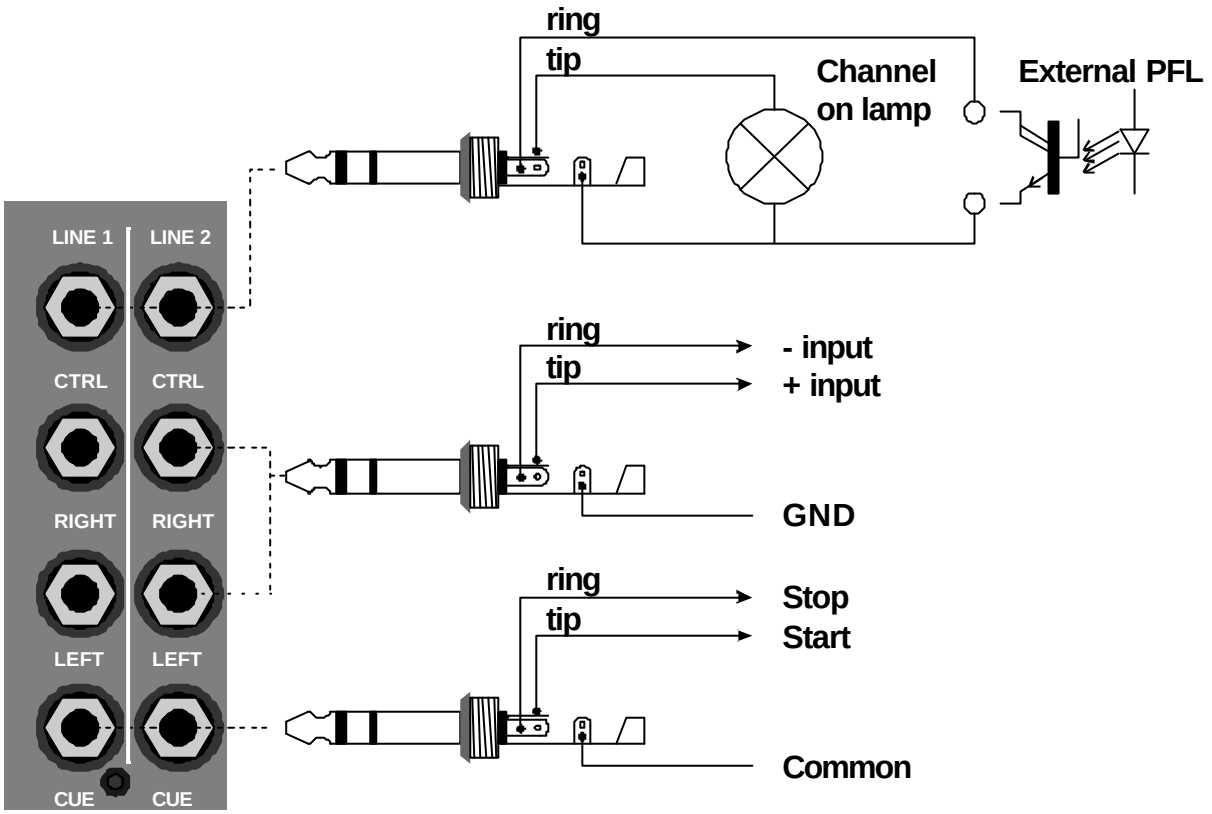
**CUE** Maximum ratings: 24Vdc, 10mA

Opto-coupler outputs to start and stop the connected equipment. As a maximum 24Vdc, or 10mA current may be switched. The outputs are active continuously (not pulsed). This function is only available when line 1 is selected.

## Connecting the BCS52S(E)

At the BCS52S(E) connectorboard eight connectors can be found. Each input has four jack connectors:

| Name | Type | In/ Out | Description |
|---|---|---|---|
| CTRL | 6.3mm stereo jack | In & Out | Channel on indicator and PFL input |
| RIGHT | 6.3mm stereo jack | In | Balanced right line input |
| LEFT | 6.3mm stereo jack | In | Balanced left line input |
| CUE | 6.3mm stereo jack | Out | Start/ stop output |




## Technical description

**CTRL** Ext. PFL logical input: 15V, 100kOhm; pulldown. Lamp power: 12Vdc, 1W max

This connector has two functions: connecting an external module-on indicator and a logical input for an external PFL switch. When this input is pulled low (with an opto-coupler for example) the channel will switch the PFL on. This function is available for line 1 and line 2.

**LEFT/ RIGHT** Input level: -14 ... +20 dBm, Impedance: 10 kOhm

Connection for balanced stereo line inputs. With an optional RIAA add-on PCB it is possible to connect a record player.

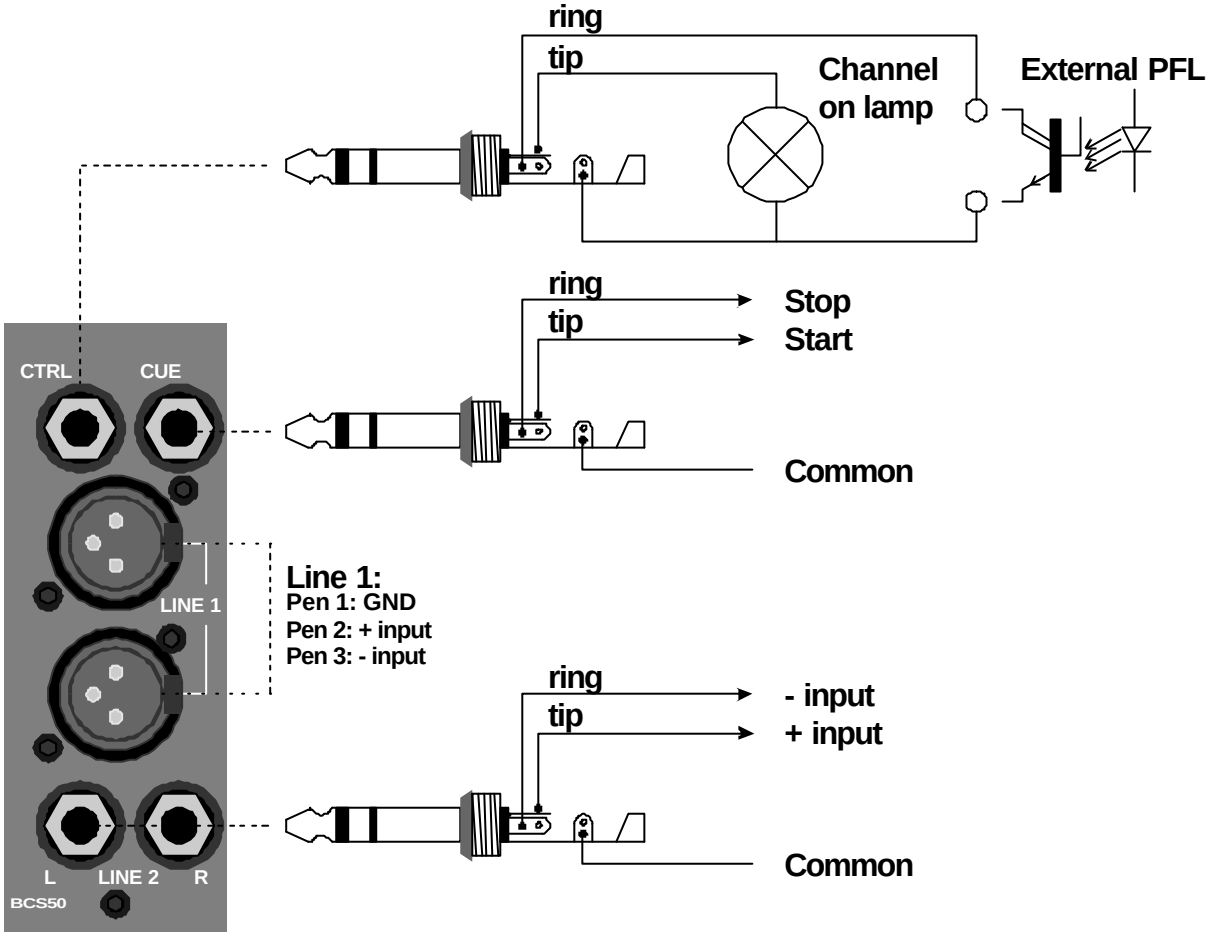
**CUE** Maximum ratings: 24Vdc, 10mA

Opto-coupler outputs to start and stop the connected equipment. As a maximum 24Vdc, or 10mA current may be switched. The outputs are switchable between continue and pulse. This function is available for line 1 and line 2.

## Connecting the BCS52N(E)

At the BCS52N(E) connectorboard six connectors can be found:

| Name | Type | In/ Out | Description |
|---|---|---|---|
| CTRL | 6.3mm stereo jack | In & Out | Channel on indicator and PFL input |
| LINE 1 | XLR-F | In | Balanced line 1 inputs |
| LINE 2 | 6.3mm stereo jack | In | Balanced line 2 inputs |
| CUE | 6.3mm stereo jack | Out | Start/ stop output |




## Technical description

**CTRL** Ext. PFL logical input: 15V, 100kOhm; pulldown. Lamp power: 12Vdc, 1W max

This connector has two functions: connecting an external module-on indicator and a logical input for an external PFL switch. When this input is pulled low (with an opto-coupler for example) the channel will switch the PFL on. This connector is only active when line 1 is selected.

**LINE 1** Input level: -14 ... +20 dBm, Impedance: 10 kOhm

Connections for a balanced stereo line input on XLR connectors.

**LINE 2** Input level: -14 ... +20 dBm, Impedance: 10 kOhm

Connections for a balanced stereo line inputs on 6.3mm stereo jack connectors.

**CUE** Maximum ratings: 24Vdc, 10mA

Opto-coupler outputs to start and stop the connected equipment. As a maximum 24Vdc, or 10mA current may be switched. The outputs are switchable between continue and pulse. This function is only available when line 1 is selected.

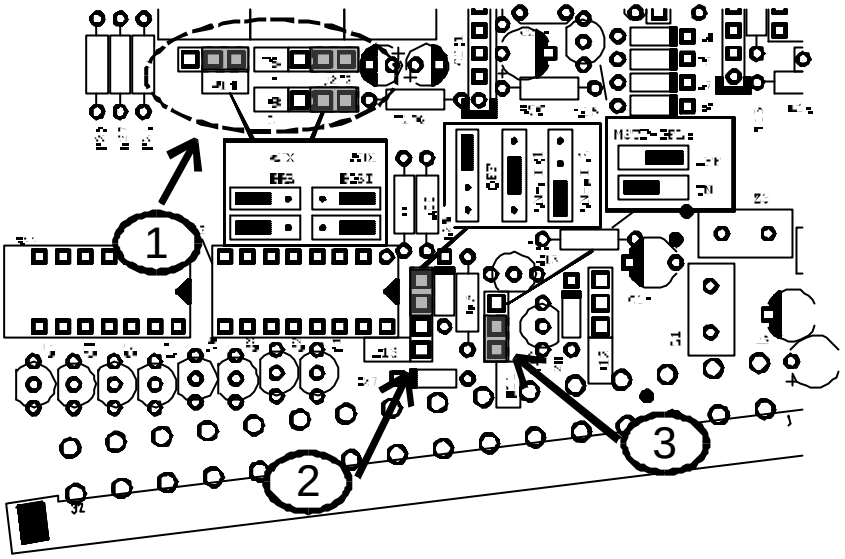
### Tone control

Tone control is only available on BCS52(S)(N)E modules. The crossover frequencies are:

HIGH: +/-12dB shelving @ 12 kHz
MID: +/- 12dB bell @ 1.3 kHz
LOW: +/- 16dB shelving @ 30 Hz

### Jumper settings

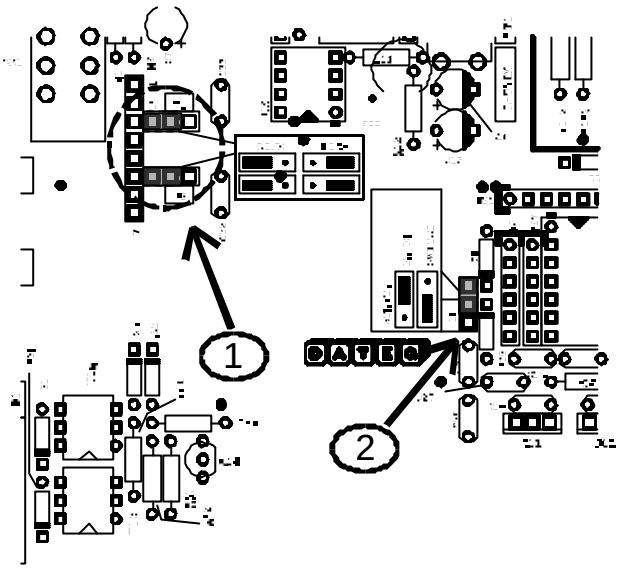
With the internal jumpers various settings/ automations can be enabled or disabled. The drawing below shows a BCS52 PCB with the jumpers marked grey that appear in all BCS52(S)(N) modules. The module-type specific jumpers are showed on the next pages.




| Jumper name | Possibilities | Description |
|---|---|---|
| AUX (1) | POST (D) | The after-fader signal is routed to the AUX-buss. All three jumpers (P8, P9 and P14) have to be in the same position! |
| | PRE | The pre-fader signal is routed to the AUX-buss. All three jumpers (P8, P9 and P14) have to be in the same position! |
| ON-AIR (2) | OFF (D) | No ON-AIR outputs will be activated when the channel is switched on. |
| | ON-AIR1 | When the channel is switched on ON-AIR1 will be activated. The studio output will be muted to prevent an acoustical feedback. |
| | ON-AIR2 | When the channel is switched on ON-AIR2 will be activated. |
| MSTR (3) | ON (D) | When the PFL-switch is pressed the CR will switch automatically to PFL. This makes the signal directly audible for the technician. |
| | OFF | The signal is mixed to the PFL-buss, but the CR-selector will not automatically switch to PFL. |

(D) indicates the default setting

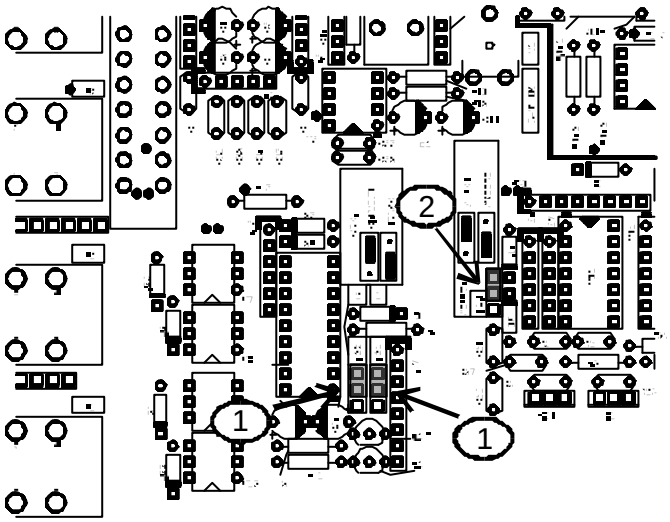
## BCS52 settings




| Jumper name | Possibilities | Description |
|---|---|---|
| LINE/ RIAA (1) | LINE | Both jumpers must be in this position when the RIAA option is not installed. |
| | RIAA | Both jumpers must be in this position when the RIAA option is installed. |
| START (2) | FADER (D) | The channel is activated when the fader is opened. |
| | SWITCH | The channel is activated when the ON-key is pressed. When the fader is opened and the ON-lamp does not light up no audio will be fed through. |

(D) indicates the default setting

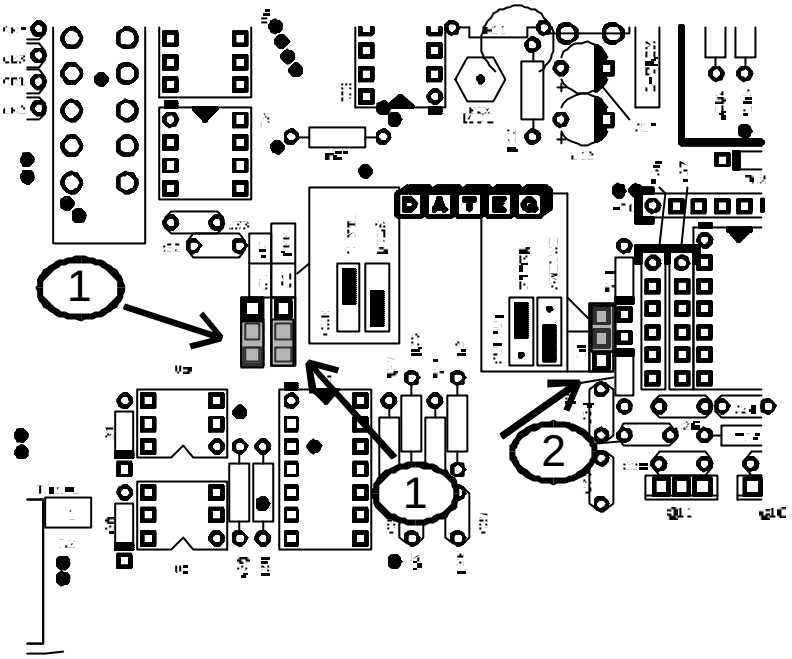
## BCS52S settings




| Jumper name | Possibilities | Description |
|---|---|---|
| CUE (1) | CONTINU (D) | After the module has started or stopped the start or stop outputs remains active. (P21 controls line 1 and P22 controls line 2) |
| | PULSE | The start and stop output generate a pulse (500mSec) when the module is started or stopped. (P21 controls line 1 and P22 controls line 2) |
| START (2) | FADER (D) | The channel is activated when the fader is opened. |
| | SWITCH | The channel is activated when the ON-key is pressed. When the fader is opened and the ON-lamp does not light up no audio will be fed through. |

(D) indicates the default setting

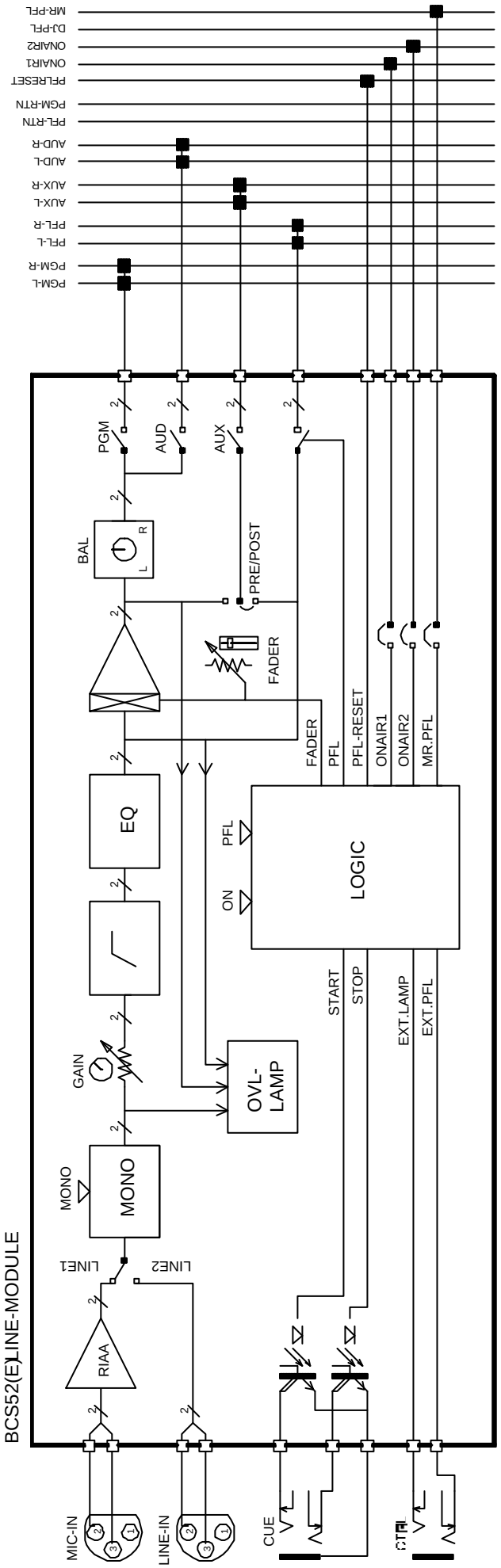
## BCS52N settings



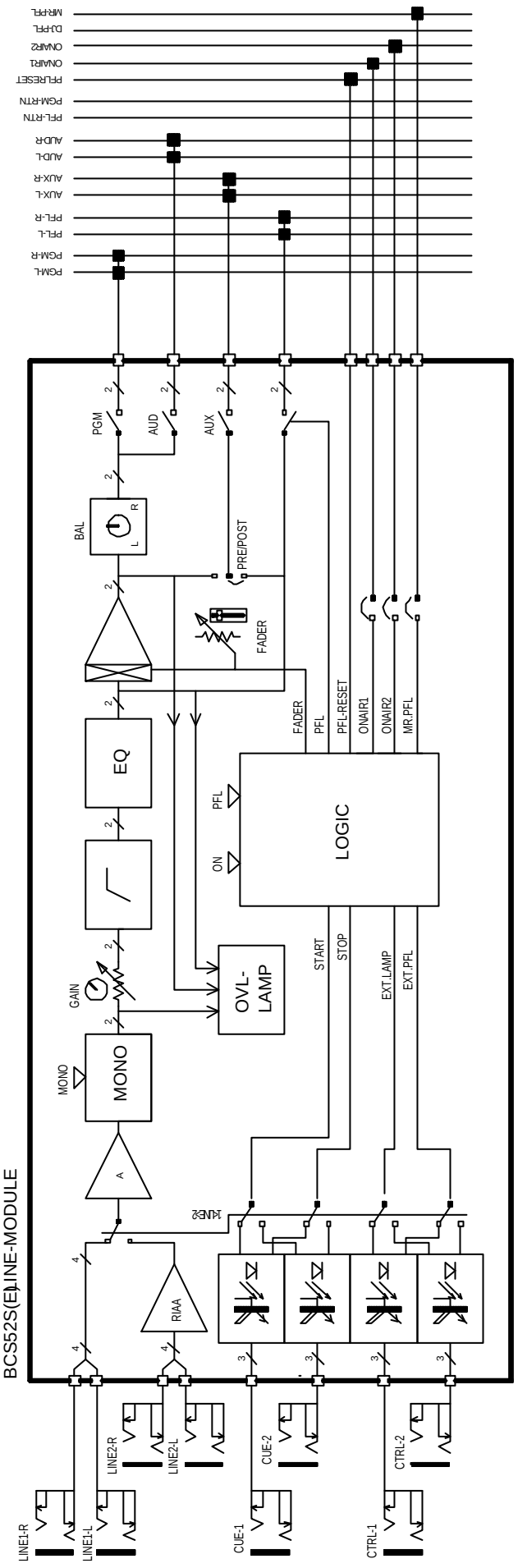

| Jumper name | Possibilities | Description |
|---|---|---|
| CUE (1) | CONT. (D) | After the module has started or stopped the start or stop outputs remains active. (J1 controls line 1 and J2 controls line 2) |
| | PULS | The start and stop output generate a pulse (500mSec) when the module is started or stopped. (J1 controls line 1 and J2 controls line 2) |
| START (2) | FADER (D) | The channel is activated when the fader is opened. |
| | SWITCH | The channel is activated when the ON-key is pressed. When the fader is opened and the ON-lamp does not light up no audio will be fed through. |

(D) indicates the default setting

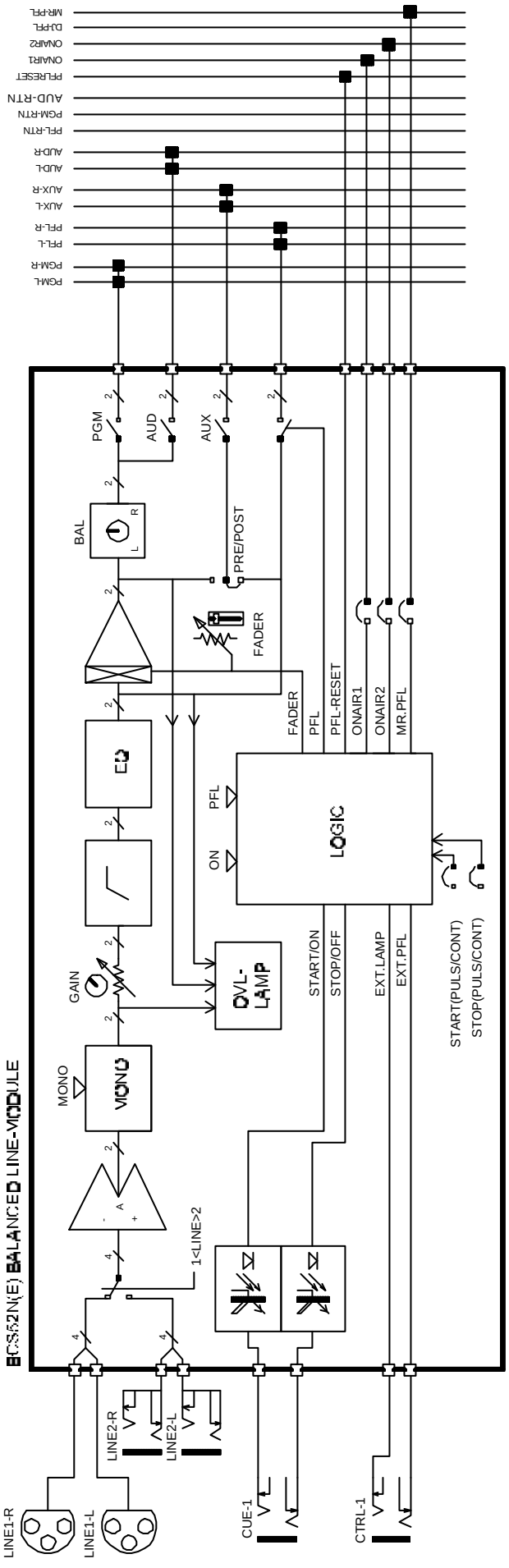
## Blockdiagram BCS52(E)



## Blockdiagram BCS52S(E)

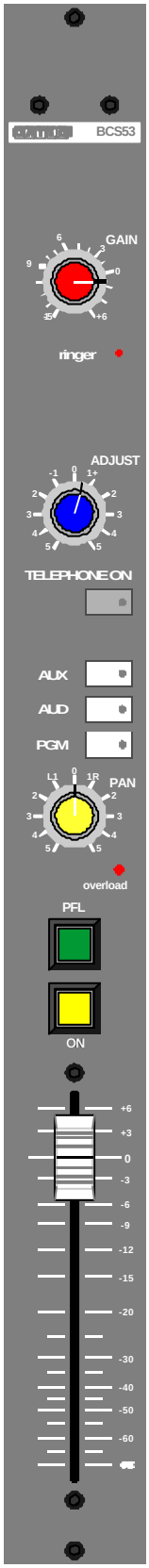


## Blockdiagram BCS52N(E)



# BCS53 Telephone modules

An analogue subscriber line can be directly connected to a BCS53 module. This module has a built-in analogue hybrid. When more than two BCS53 modules are on air simultaneously the program-signal will get coloured. It is possible to have more than two lines off-hook when they are not on-air. When more than two phone-lines must be on-air simultaneously the BCS53T modules in combination with a digital hybrid should be used.




**GAIN** Input-sensitivity control. When the gain is turned CW the incoming signal will be amplified and the return signal will be attenuated.

**RINGER** The LED flashes on an incoming call.

**ADJUST** R-balance adjust for tuning the internal hybrid for minimal return signal. This control has to be adjusted so that a minimum of sound coloration will occur during the telephone conversation.

**TEL. ON** By pressing the button the phone-line will go on,- or off-hook.

**AUX** Routes the signal to the AUX-buss.
**AUD** Routes the signal to the AUD-buss.
**PGM** Routes the signal to the PGM-buss.

**PAN** Panorama control. Places the mono-sound in the stereo image.

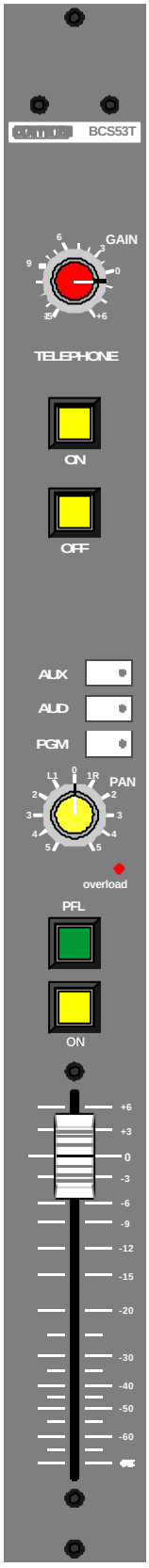
**OVERL.** This LED illuminates when the signal in the module is too high, and in danger of becoming distorted.

**PFL** Pre-Fader Listening. By pressing this switch the signal will be audible on the head-phones. The hybrid will automatically go off-hook.

**ON** Switch to activate the module. When the ON-lamp lights up the signal can be heard on the selected busses (AUX, AUD, PGM). When faderstart is configured the lamp will automatically light up when the fader is opened.
When the module is activated the PFL function will reset.

**FADER** With the fader the signal-level can be controlled. The nominal level is 0dB.

To a BCS53T module an external digital (Telos) hybrid can be connected. A digital hybrid has a superior trans-hybrid loss than an analogue hybrid. The advantages are a better sound-quality and the fact that more than two lines can be active at the same time. The exact amount of possible active lines depend on the quality of the subscriber lines and the trans-hybrid loss per module.




**GAIN** Input sensitivity control. When the gain is turned clockwise the incoming signal will be amplified and the return signal will be attenuated.

**TEL. ON/ OFF** On and off switches to remote control the Telos hybrid. The lamps alternately blink on an incoming call.

**AUX** Routes the signal to the AUX-buss.

**AUD** Routes the signal to the AUD-buss.

**PGM** Routes the signal to the PGM-buss.

**PAN** Panorama control. Places the mono-sound in the stereo image.

**OVERL.** This LED illuminates when the signal in the module is too high, and in danger of becoming distorted.

**PFL** Pre-Fader Listening. By pressing this switch the signal will be audible on the head-phones. The hybrid will automatically go off-hook.

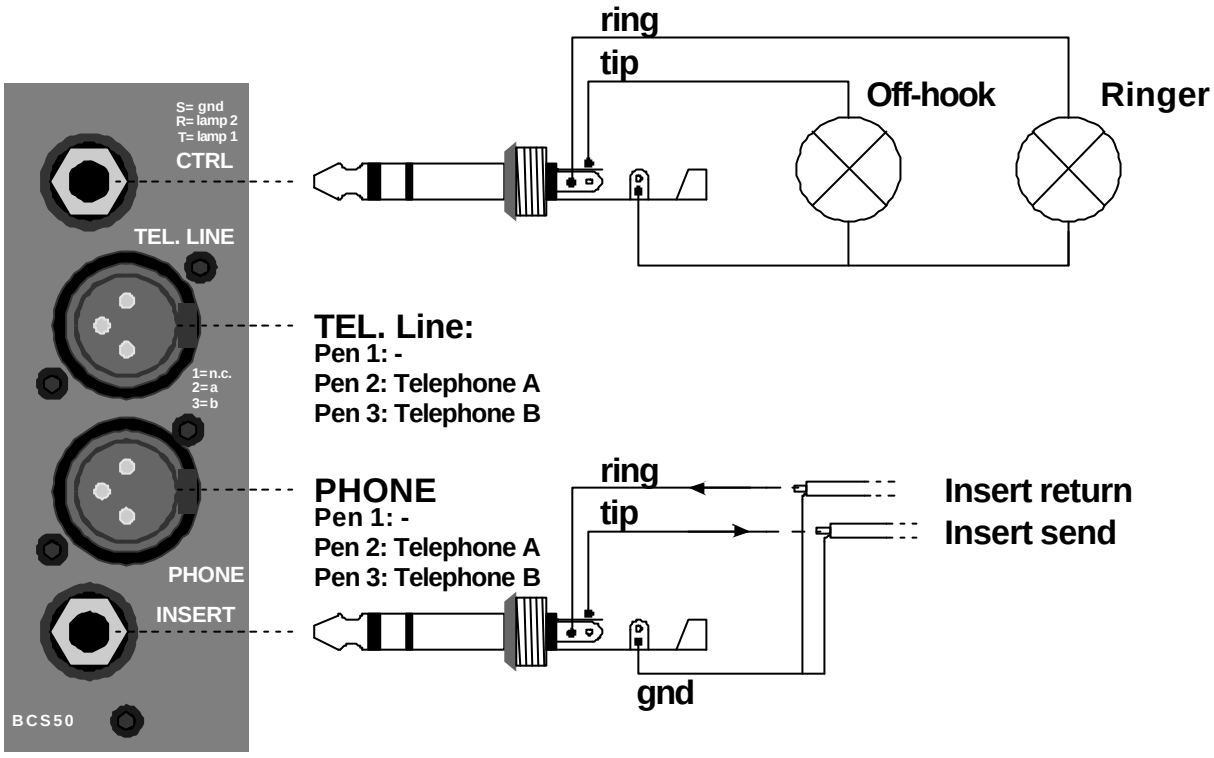
**ON** Switch to activate the module. When the ON-lamp lights up the signal can be heard on the selected busses (AUX, AUD, PGM). When faderstart is configured the lamp will automatically light up when the fader is opened.
When the module is activated the PFL function will reset.

**FADER** With the fader the signal-level can be controlled. The nominal level is 0dB.

## Connecting the BCS53

At the BCS53 connectorboard four connectors can be found:

| Name | Type | In/ Out | Description |
|---|---|---|---|
| CTRL | 6.3mm stereo jack | Out | Connector for a telephone active and a ringer indicator |
| TEL. LINE | XLR-M | In & out | Subscriber line |
| PHONE | XLR-F | In & out | Connection for an additional phone |
| INSERT | 6.3mm stereo jack | In & out | Insert: possibility for effect equipment |




## Technical description

**CTRL** Ext. Off-hook and ringer active outputs. 12Vdc, 1W max

To connect a ringer and a telephone-line active indicator.

TIP Multiple BCS53(T) ringer outputs can be linked together to combine the ringer active signal.

**TEL. LINE** Default subscriber line: input level: -21 ... 0 dBm, Impedance: 600 Ohm

To connect the analogue subscriber line.

**PHONE** Default subscriber line: input level: -21 ... 0 dBm, Impedance: 600 Ohm

To connect an additional phone. This can be used to dial a telephone number.

**INSERT** Level: 0dBm, Impedance 10 kOhm

Effect equipment can be connected to the insert connector.

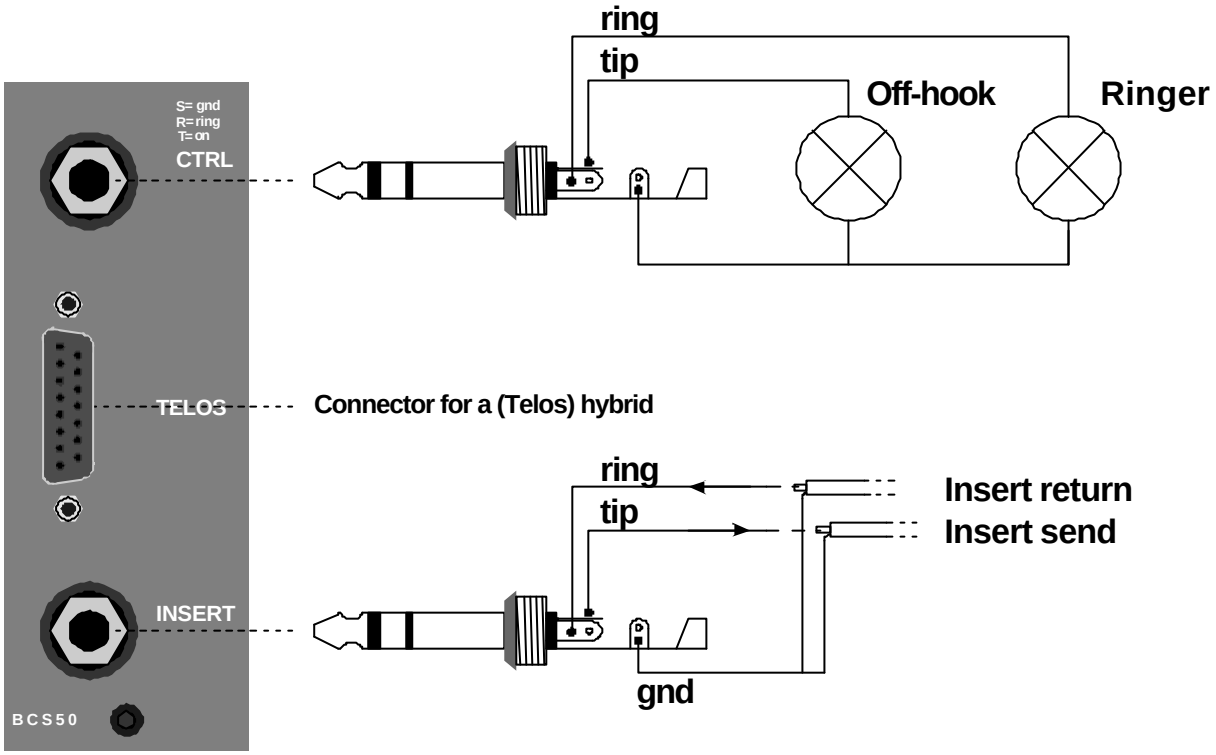
**Filters:**

Input filter: 300 Hz ... 3 kHz, 18dB/octave
Output filter: 300 Hz ... 3 kHz, 18dB/octave

## Connecting the BCS53T

At the BCS53T connectorboard three connectors can be found;

| Name | Type | In/ Out | Description |
|---|---|---|---|
| CTRL | 6.3mm stereo jack | Out | Connector for a telephone active and a ringer indicator |
| TELOS | SUB-D-15-M | In & out | Connector for a Telos hybrid |
| INSERT | 6.3mm stereo jack | In & out | Insert: possibility for effect equipment |




## Technical description

**CTRL** Ext. Off-hook and ringer active connector. 12Vdc, 1W max

To connect a ringer and a telephone-line active indicator. Multiple BCS53(T) ringer outputs can be linked together to combine the ringer active signal.

**TELOS** Special Telos interface

A Telos hybrid should be connected here.

**INSERT** Level: 0dBm, Impedance 10 kOhm

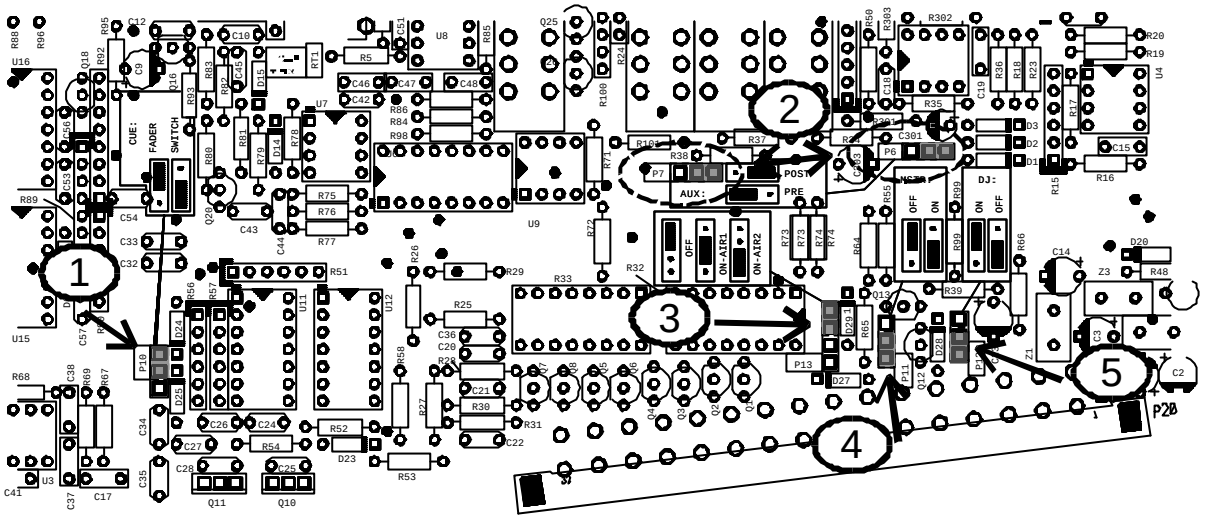
Effect equipment can be connected to the insert connector.

### SUB-D-15 specifications

| | | | |
|---|---|---|---|
| 1 | - output (return) | | |
| 2 | GND | 9 | + output (return) |
| 3 | - input (send) | 10 | GND |
| 4 | n.c. | 11 | + input (send) |
| 5 | Logical GND | 12 | n.c. |
| 6 | OFF (on-hook) remote (opto-coupler) | 13 | ON (off-hook) remote (opto-coupler) |
| 7 | n.c. | 14 | n.c. |
| 8 | Subscriber line | 15 | Subscriber line |

## Jumper settings

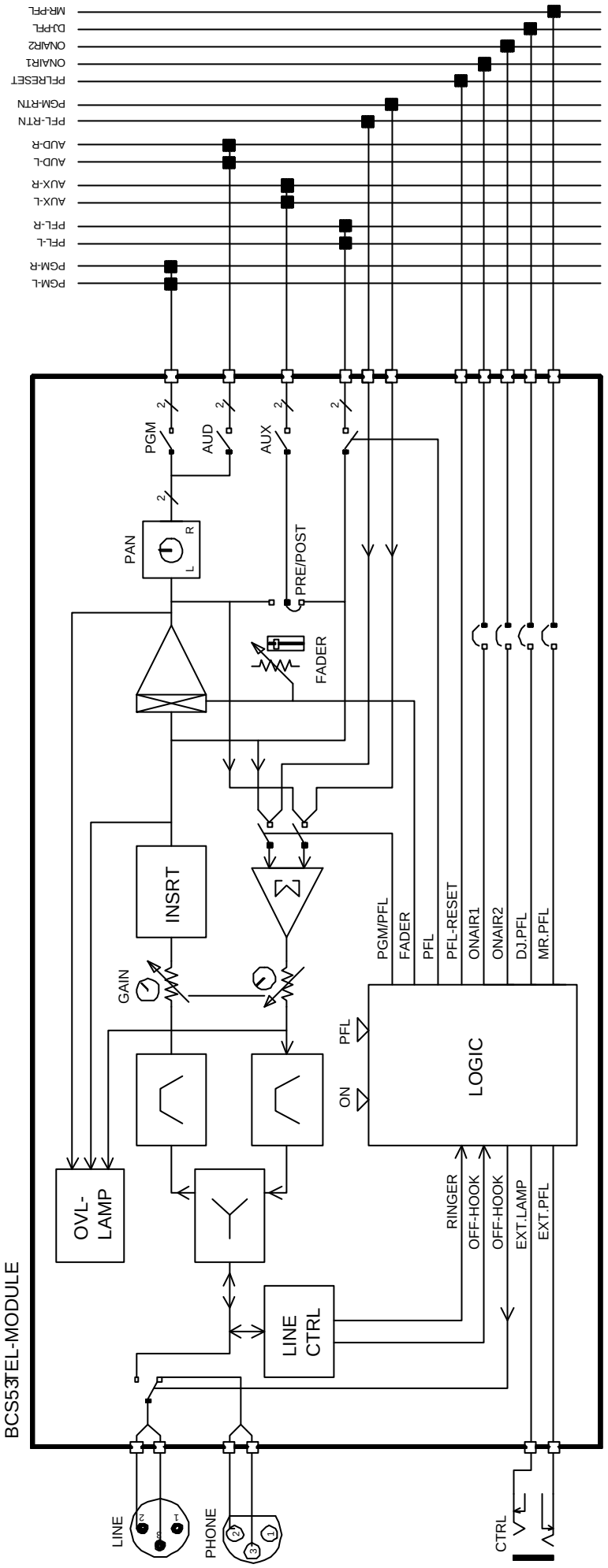
The jumpers in a BCS53 and BCS53T module have the same functionality and the same position. That is why only the BCS53 PCB is shown below.



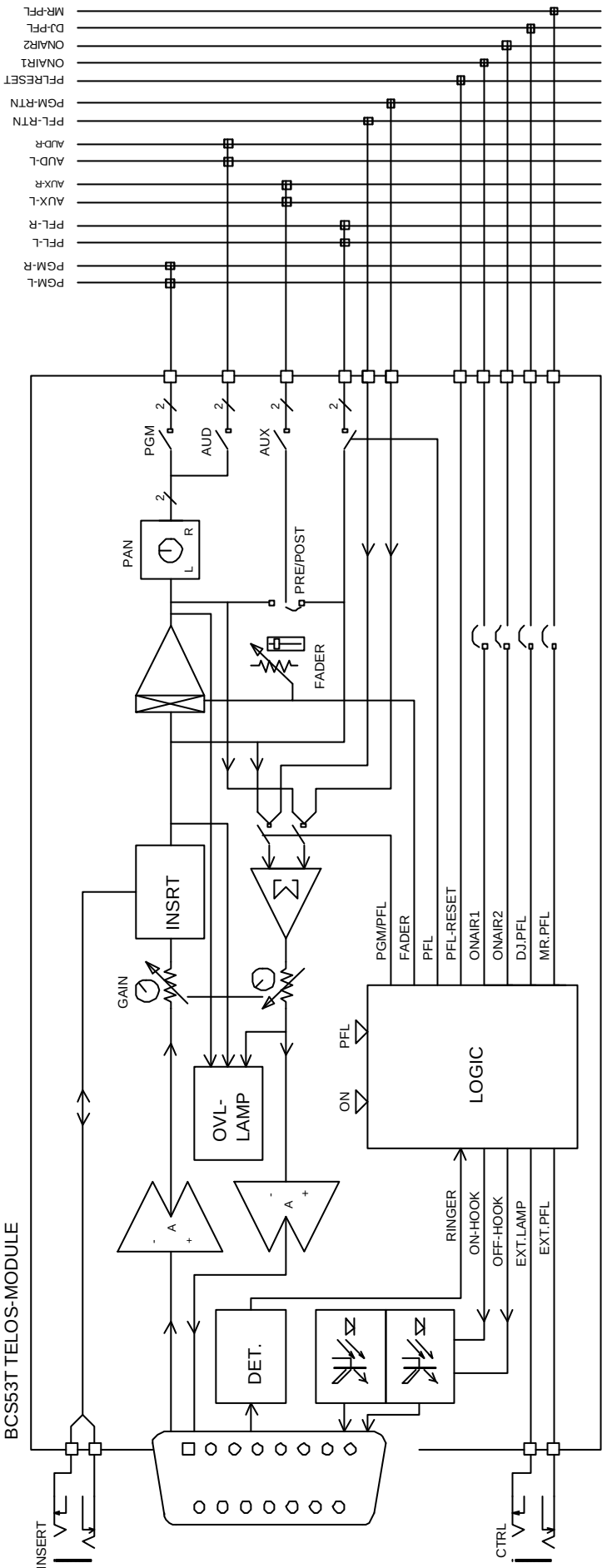

| Jumper name | Possibilities | Description |
|---|---|---|
| CUE (1) | FADER (D) | The channel is activated when the fader is opened. |
| | SWITCH | The channel is activated when the ON-key is pressed. When the fader is opened and the ON-lamp does not light up no audio will be fed through. |
| AUX (2) | POST (D) | The after-fader signal is routed to the AUX-buss. Both jumpers (P6 and P7) have to be in the same position! |
| | PRE | The pre-fader signal is routed to the AUX-buss. Both jumpers (P6 and P7) have to be in the same position! |
| ON-AIR (3) | OFF (D) | No ON-AIR outputs will be activated when the channel is switched on. |
| | ON-AIR1 | When the channel is switched on ON-AIR1 will be activated. The studio output will be muted to prevent an acoustical feedback. |
| | ON-AIR2 | When the channel is switched on ON-AIR2 will be activated. |
| MSTR (4) | ON (D) | When the PFL-switch is pressed the CR will switch automatically to PFL. This makes the signal directly audible for the technician. |
| | OFF | The signal is mixed to the PFL-buss, but the CR-selector will not automatically switch to PFL. |
| DJ (5) | ON | When the module is activated all PFL-buttons will reset and the CR output will be muted to prevent from an acoustical feedback with the DJ-microphone. It is also possible to let the CR-selector switch to AIR or PGM. This will be explained later. |
| | OFF (D) | This function is disabled. |

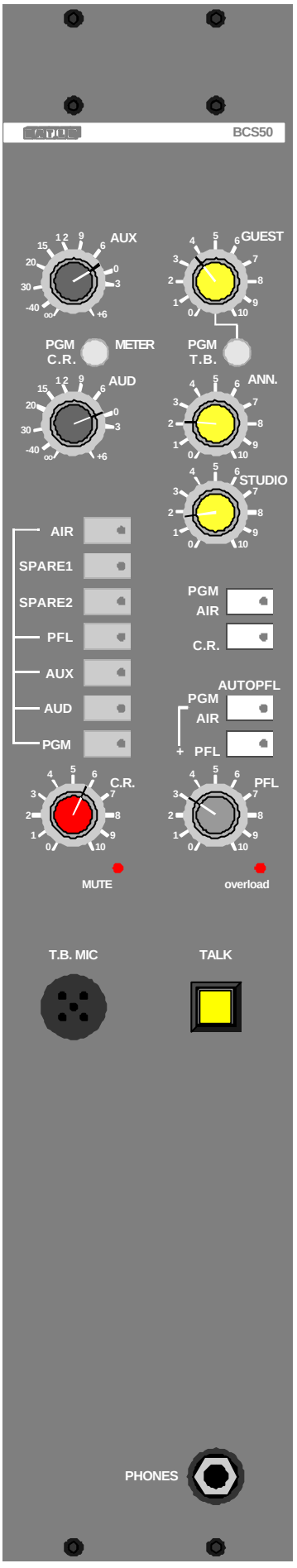
(D) indicates the default setting

## Blockdiagram BCS53



## Blockdiagram BCS53T






**AUX** Outputlevel control for the AUX-signal

**METER** Sends the PGM or the C.R. Signal to the VU-meter

**AUD** Outputlevel control for the AUD-signal

**AIR ... PGM** CR-selector. Select the source to be monitored in the C.R.

**C.R.** Outputlevel control for the C.R.

**MUTE** LED illuminates when the C.R. output is muted (DJ mic. active)

**T.B. MIC** Talkback microphone for the technician

**GUEST** Volumecontrol for the GUEST headphones

**PGM/TB** Source selector for the GUEST headphones

**ANN.** Volumecontrol for the ANNOUNCER headphones

**STUDIO** Volumecontrol for the STUDIO output

**PGM/AIR** Source selector for the STUDIO and the ANNOUNCER outputs

**C.R.** When the switch is pressed the STUDIO and the ANNOUNCER output follow the C.R. signal

**PGM/AIR** The C.R. automatically listens to PGM or AIR when the DJ-microphone is active

**+PFL** When PFL is activated the PGM or AIR signal can be monitored in the background (-20dB)

**PFL** Volumecontrol for the headphones

**overload** LED illuminates when the PGM signal in the master is overloaded

**TALK** Talkback button

**PHONES** Headphones connector

### Operation of the BCS50 master

**AUX** This control adjusts the volume of the signal on the AUX-output.

**METER** The VU-meter has the possibility to monitor the PGM signal, but it is also possible to monitor the C.R. signal. All available signals in the BCS50 can be monitored. This makes it possible to monitor the PFL signal of a channel so that the gain-setting can be tuned (0dB is the nominal level).

**AUD** This control adjusts the volume of the signal on the AUD-output.

**C.R. SEL.** The C.R. selector selects the source that can be heard on the C.R. speakers and the technicians headphones. Due to the built-in automations another LED than the LED underneath the selected key can illuminate. The monitored source is the source indicated by the LED.

**C.R. MUTE** Volumecontrol for the C.R. speakers. When the DJ-microphone is active the C.R. will be muted. The mute LED illuminates.

**T.B. MIC TALK** With the built-in microphone the technician can talk to the announcer and the studio output. The microphone is activated by pressing the talk-button. It is also possible to talk to the guest. To do so the PGM/TB switch has to be pressed.

**GUEST** Volumecontrol for the guest headphones.

**PGM/TB** When this switch is pressed the guest headphones will be linked to the same source as the announcer headphones. When the switch is not pressed the program signal will be heard.

**ANN.** Volumecontrol for the announcer headphones.

**STUDIO** Volumecontrol for the studio speakers.

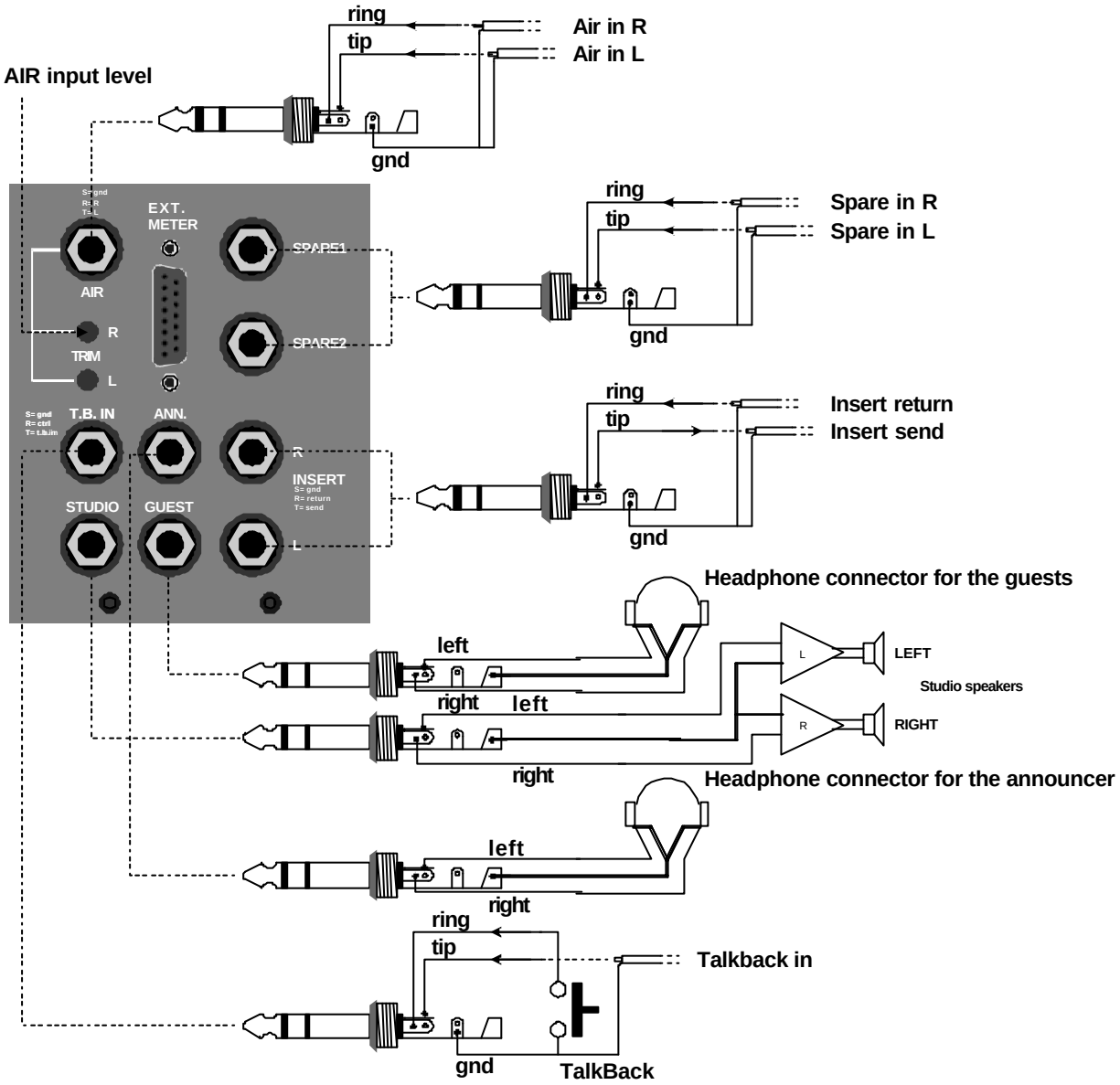
**PGM/AIR C.R.** These two keys determine the source for the studio and the announcer outputs. When the C.R. key is pressed these two outputs will be linked to the C.R. source. When the key is not pressed the outputs will be linked to PGM or to AIR.

TIP By activating this function the announcer can talk to a guest on the telephone while he is off-air. To do this the announcers microphone and the telephone module must be switched to PFL. The technician can also talk to the guest by switching his own microphone to PFL.

**PGM/AIR +PFL** When the DJ-microphone is active the BCS50 master can automatically switch to the AIR or PGM signal. With the PGM/AIR switch you can select between these two sources. When the mixer is used as a recording unit over the AUD-buss while the normal radio-signal is fed through the PGM-buss this function is unpractical. That is why this function can be disabled. The +PFL key makes it possible to monitor the program or the air signal (depending on the PGM/AIR switch) when listening to PFL, so that the technician can monitor the current program. The signal is added at a -20dB level.

**PFL** Volumecontrol for the technicians headphones.

**overload** The LED illuminates when the program signal in the master can become distorted.



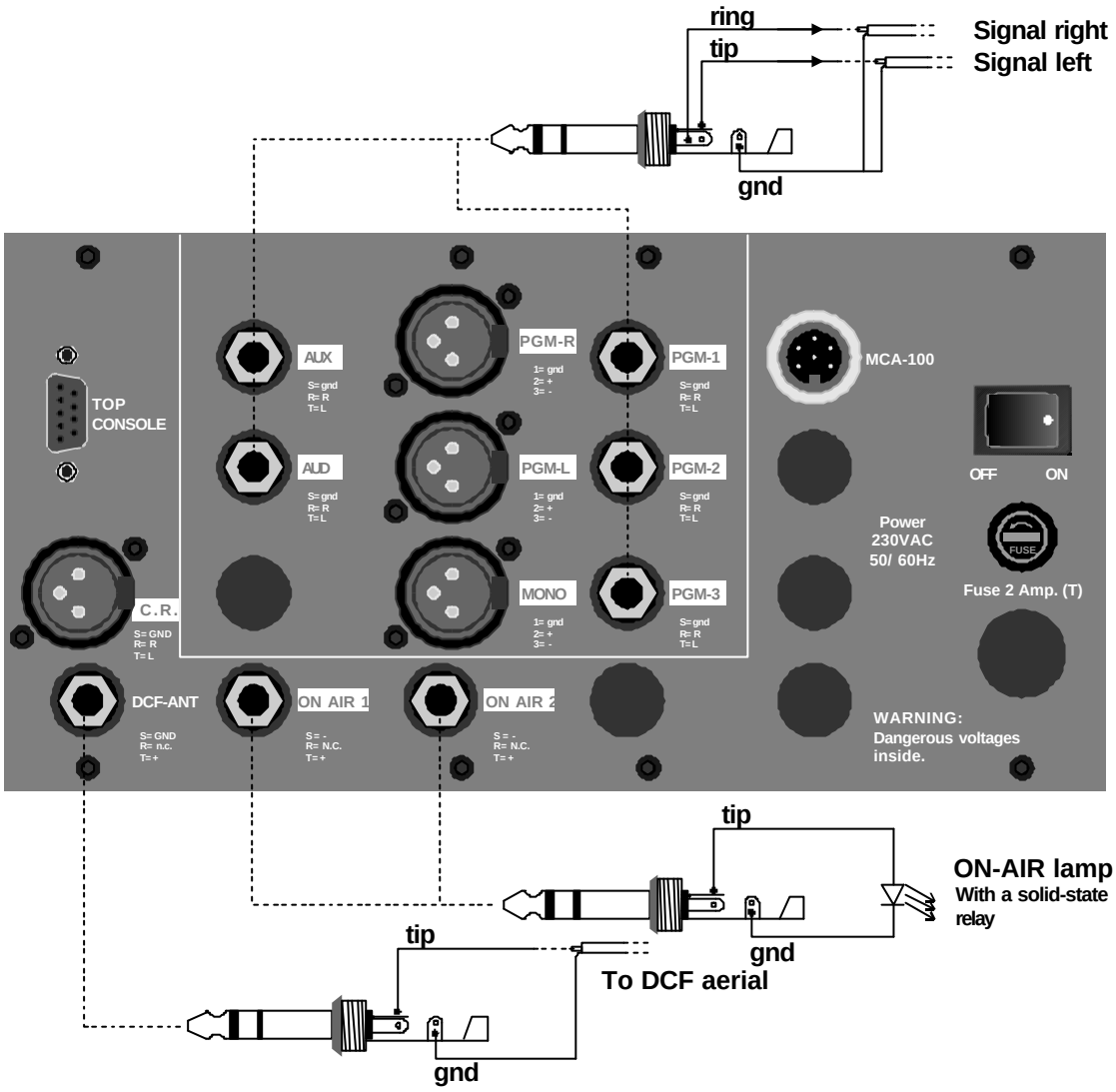

## Connections

### External meter connections

| | | | |
|---|---|---|---|
| 1 | GND | | |
| 2 | PGM-L | 9 | PGM-R |
| 3 | AIR-L | 10 | AIR-R |
| 4 | SPARE 1-L | 11 | SPARE 1-R |
| 5 | SPARE 2-L | 12 | SPARE 2-R |
| 6 | AUD-L | 13 | AUD-R |
| 7 | AUX-L | 14 | AUX-R |
| 8 | PFL-L | 15 | PFL-R |

### INSERT-L and INSERT-R

Additional compression equipment can be connected to the mixer with these inserts.




**TOP CONSOLE**

Connector for the meterbridge

**C.R.** Output level: 0dBm adjustable, Impedance: 600 Ohm, XLR-M

Connector for the control room amplifier.

**DCF-ANT**

When a BCS121 DCF-clock is installed the DCF-aerial must be connected here.

**AUX** Output level: 0dBm adjustable, Impedance: 600 Ohm, 6.3mm stereo jack

Auxiliary output.

**AUD** Output level: 0dBm adjustable, Impedance: 600 Ohm, 6.3mm stereo jack

Audition output.

**ON AIR 1 + ON AIR 2** 12Vdc, 1kOhm logical input, 6.3mm stereo jack

With a solid-state relay an external ON-AIR indicator can be connected here (for example the DATEQ OA-1). A 12Vdc control voltage is applied between the tip and the shield when the ON-AIR output is active. The maximum current is 12mA.

**PGM-L, PGM-R and MONO** Output level: +6dBm, Impedance: 600 Ohm, XLR-M

Balanced program outputs. They can be used to connect a cable-modulator or the main transmitter. The mono output is the left and the right signal combined.

**PGM-1, PGM-2 and PGM-3** Output level: 0dBm, Impedance: 600 Ohm, 6.3mm stereo jack

Additional unbalanced program outputs. These can be used to connect amplifiers, recorders etc. inside the studio.

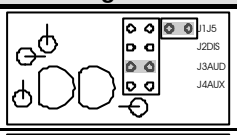
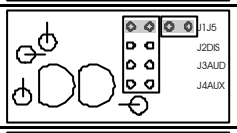
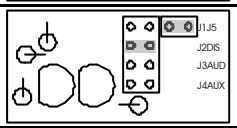
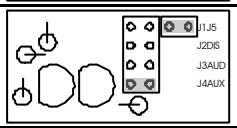
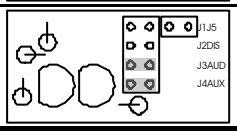
## Technical information

| Input | Type | Level | Impedance | Connector |
|---|---|---|---|---|
| AIR | Unbalanced stereo | -15 ... +6dBm | 10 kOhm | 6.3mm stereo jack |
| SPARE 1 | Unbalanced stereo | 0dBm | 10 kOhm | 6.3mm stereo jack |
| SPARE 2 | Unbalanced stereo | 0dBm | 10 kOhm | 6.3mm stereo jack |
| TalkBack | Unbalanced mono | 0dBm | 10 kOhm | 6.3mm stereo jack |
| | TB control | 12V, 100kOhm; switch to gnd | | |
| PGM insert L | Unbalanced mono | 0dBm | 10 kOhm | 6.3mm stereo jack |
| PGM insert R | Unbalanced mono | 0dBm | 10 kOhm | 6.3mm stereo jack |

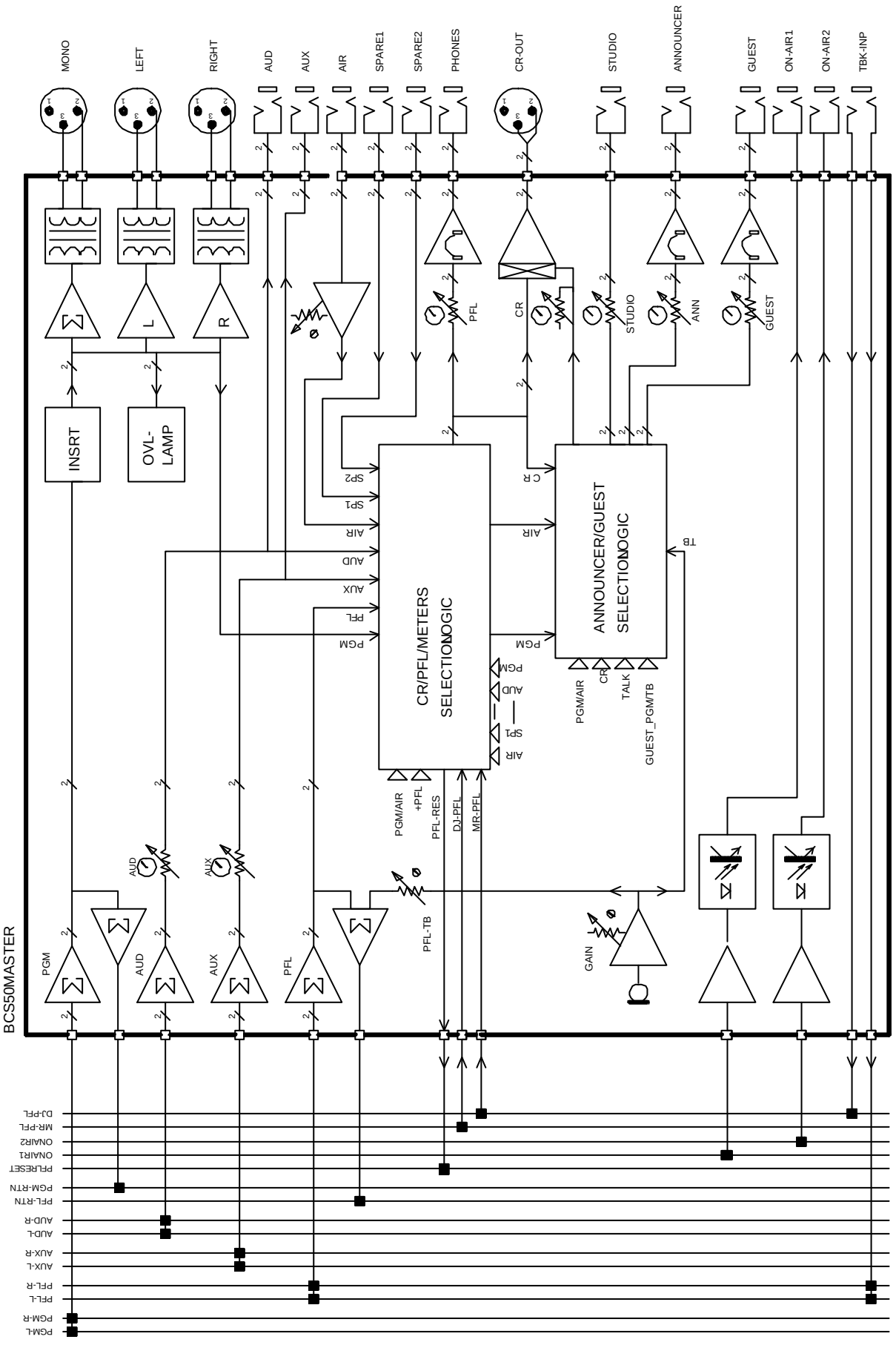
| Output | Type | Level | Impedance | Connector |
|---|---|---|---|---|
| PGM-L | Balanced left | +6 dBm | 600 ohm | XLR-M |
| PGM-R | Balanced right | +6 dBm | 600 ohm | XLR-M |
| MONO | Balanced mono (L+R) | +6 dBm | 600 ohm | XLR-M |
| PGM-1 | Unbalanced stereo | 0 dBm | 600 ohm | 6.3mm stereo jack |
| PGM-2 | Unbalanced stereo | 0 dBm | 600 ohm | 6.3mm stereo jack |
| PGM-3 | Unbalanced stereo | 0 dBm | 600 ohm | 6.3mm stereo jack |
| AUX | Unbalanced stereo | 0 dBm | 600 ohm | 6.3mm stereo jack |
| AUD | Unbalanced stereo | 0 dBm | 600 ohm | 6.3mm stereo jack |
| STUDIO | Unbalanced stereo | 0 dBm | 600 ohm | 6.3mm stereo jack |
| ANNOUNCER | Headphones | | | 6.3mm stereo jack |
| GUEST | Headphones | | | 6.3mm stereo jack |
| C.R. | Unbalanced stereo | 0 dBm | 600 ohm | XLR-M |
| ON AIR 1 | Control voltage | 12Vdc, 1 kOhm | | 6.3mm stereo jack |
| ON AIR 2 | Control voltage | 12Vdc, 1 kOhm | | 6.3mm stereo jack |
| Ext. Meter | Unbalanced stereo | 0 dBm | 1 kOhm | SUB-D-15-F |
| INSERT-L | Unbalanced stereo | 0 dBm | 600 ohm | 6.3mm stereo jack |
| INSERT-R | Unbalanced stereo | 0 dBm | 600 ohm | 6.3mm stereo jack |
| MCA-100 | Connector for the MCA-100 headphones amplifier. With this amplifier each announcer and guest can have their own headphones with volume control and a cough-button. | | | |

## Jumper settings

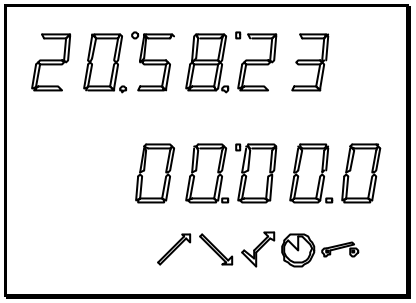
With two jumpers the AutoPFL function can be configured. The jumpers are situated on a small add-on PCB at the left PCB of the BCS50 master unit.
By default the mixer is configured to disable the AutoPFL function when the C.R. selector is switched to audition. In all the other cases the C.R. selector will automatically switch to PGM or AIR when the DJ-microphone is activated. It is also possible to disable this function when AUX is selected or to disable all AutoPFL functionality. See the table below:

| Jumper settings | Description | |
|---|---|---|
|  | Default | Default setting. No AUTO-PFL when AUD is selected on the C.R. selector. |
|  | Always active | AUTO-PFL always active. |
|  | No AUTO-PFL | AUTO-PFL disabled. |
|  | AUX | No AUTO-PFL when AUX is selected on the C.R. selector. |
|  | AUD+AUX | No AUTO-PFL when AUD or AUX is selected on the C.R. selector. |

## Blockdiagram BCS58 master



## BCS121 clock/timer module



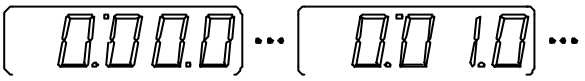

The BCS121 clock/timer-module receives its time-of-day-information from the German DCF77-transmitter at Mainflingen (near Frankfurt). The range of this transmitter is approximately 1000 miles. Besides extreme accuracy, the BCS121 keeps track of daylight-saving-time etc. Unique is the infra-red remote control for selecting operation mode and entering time.

***Timer***

The timer can be used counting up or down. The [MODE]-key selects the desired mode:

**TIMER COUNTING UP**

In the initial mode the BCS121 counts upwards from 0:00.0. This mode can be useful for keeping track of the elapsed time since the last record, jingle or other item was started. Triggering the timer with a microphone-channel can be useful to monitor the length of the 'spoken' parts of a radio-program.

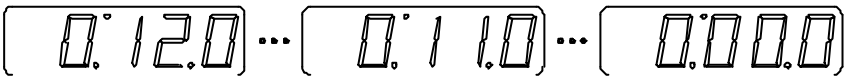



**TIMER COUTING DOWN**

To indicate the (approaching) end of a pre-recorded item, for example, the BCS121 can be set in the countdown-mode. The timer will count down from a set point to 0:00.0. This time can be entered with the remote control, for example:

*[1] [2] [ENTER]*

The timer will start counting down from 0:12.0.




**TIMER COUNTING UP/DOWN**

During an intro of a (music-) item the timer will count down to indicate the (approaching) end of the intro. When 0:00:0 is reached, the timer switches to indicating the elapsed time from the point where the timer was triggered. The intro-time can be set from the remote control the same way, for example:

*[1] [2] [ENTER]*

The timer will start counting down from 0:12:0 to 0:00:0, then counting up from 0:12:0.

## TIMER COUNTING DOWN TO A SET TIME

In this mode the timer indicates the remaining time until a set time is reached, for example the starting-time of commercials and/or news. Enter this time from the remote control unit, for example:

*[1] [7] [5] [7] [3] [4] [ENTER]*

...to count down to 17:57:34. There is an important distinction between this mode and the other modes. This mode can be run in 'background', independent from the other timer-modes. Once the set-time is programmed, the timer can be started, stopped and reset in all other modes, while the countdown timer keeps running. If you switch back to this mode, the remaining time will be displayed again.

In case the set time is approaching with the timer in a different mode, a small blinking dot is displayed on the left of the timer-display for the last 30 seconds, to draw the users attention.

## INPUT-MASK-MODE

For external triggering of the timer 8 switch-signals can be connected to the BCS121. Since it is not always desired to trigger the timer with all connected signals, each signal can be individually blocked out with the mask-option. In the initial situation all inputs are enabled, so the display will show '**1234/ 5678**'. With the [1] .. [8] - keys of the remote control unit each channel can be disabled or enabled. For example by pressing

*[3] [5] [6]*

the display will show '**12-4 / --78**'. This means channels 3, 5 and 6 are disabled. Inputs 1, 2, 4, 7 and 8 are enabled.

Please note that the BCS70 uses input 1 and 2 to control the timer, so only inputs 3 through 8 are available for user-specific signals. You should always have input 1 enabled. Input 2 can be enabled or disabled to use the timer in two different operating modes. If you enable input 2, each channel on the BCS70 which is configured to control the timer (by means of the **RES** setup-option) will restart the timer as soon as the channel is opened. If you disable input 2, the timer will run as long as there is at least one open channel on the BCS70 with the timer control setup-option selected.

### *Setting the time*

During normal reception-conditions the clock will be synchronised within 2 minutes, and the right time will appear on the display. It is also possible to use the clock with the antenna not connected ('free running'). In this case setting the clock to the right time can be done by entering the time from the remote control unit, by pressing [0] [0] [0] when in input mask mode. When this is done, **' / SEt '** will appear. For example:

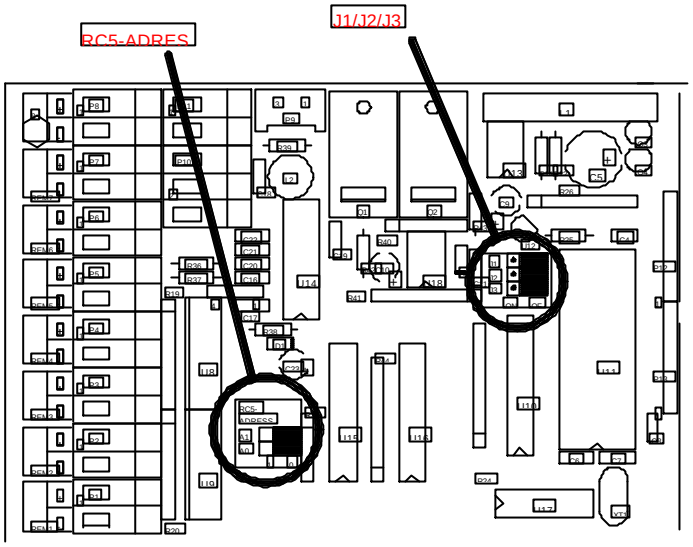
*[1] [7] [2] [8] [0] [0] [ENTER]*

The clock starts running from 17:28:00.

TIP When the clock is a little slow or fast it can be synchronised by pressing the [C] key at the whole hour when the timer is in counting-up-mode. This function is only available when no valid DCF-signal is received and the time-deviation is less than 3 minutes.

This function is available when your clock has firmware version 1.5 or higher. To check your firmware version go to the input-mask-mode and press the [C] key!

## BCS121 jumpers




| Jumper | On/Off | Function |
|---|---|---|
| J1 | ON | BCS121 configured as slave (using another Dateq clock/timer-unit as master) |
| | OFF | BCS121 configured as master (default) |
| | ON | 12-hour time format with AM/PM (default in the USA) |
| | OFF | 24-hour time format (default in Europe) |
| J2 | | (not used) |
| J3 | A0 = 0<br>A1 = 1 | Address 0 remote control (default) |
| | A0 = 1<br>A1 = 0 | Address 1 remote control (when using multiple Dateq clock/timer-units in one room, it is recommended to use different remote control addresses) |
| | A0 = 0<br>A1 = 1 | Address 2 remote control |
| | A0 = 1<br>A1 = 1 | Address 3 remote control |

## BCS121 antenna

The cable of the supplied DCF77-antenna can be extended without any problem (up to a maximum of 100 meters, 300 feet). Mount the aerial in a position where reception quality of the DCF77-transmitter is good. Be aware of the fact that the direction of the antenna is important. If the reception of the transmitter is good, the LED on the aerial will blink every second on a regular basis. If the LED doesn't blink, or blinks irregularly, reception is bad. The cause for a bad reception can often be found in computer-equipment nearby, or steel constructions in the building, blocking the long-wave signal of the transmitter.

**CAUTION:** The supplied antenna is not suitable for outside-mounting. The antenna is not waterproof, and the built-in electronic circuit will not operate properly below the freezing point and above 50 degrees Celsius.

# Technical specifications

## BCS51(E)

**MIC** ..... electronically balanced, XLR-F
- Signal level ..... -60 .. -14 dBm
- Input impedance ..... 300 ohm
- Input noise ..... < 115dB (IHF-A)
- THD+N (input to PGM) ..... 0.09 % (CCIR-RMS)

**LINE** ..... electronically balanced, XLR-F
- Signal level ..... -14 .. +26 dBm
- Input impedance ..... 10 kohm
- Input noise ..... < 80dB (IHF-A)
- THD+N (input to PGM) ..... 0.04 % (CCIR-RMS)

**EQUALISER**
- LOW ..... +/-16dB @ 60 Hz shelving
- MID ..... +/-12dB @ 1.5kHz bell-curve
- HIGH ..... +/-12dB @ 12kHz shelving

- LOWCUT ..... 12dB/octave @ 20Hz or 80Hz

**COMMON**
- Frequency range ..... 20... 30kHz @ -3dB (lowcut @20Hz)
  80... 30kHz @ -3dB (lowcut @80Hz)
- Panorama range ..... -56dB
- Overload indication ..... +18dBm

## BCS52

**BCS52(E)**

**LINE 1 and LINE 2** ..... unbalanced, XLR-F
- Signal level ..... -14 .. +20 dBm
- Input impedance ..... 10 kohm
- Input noise ..... < 80dB (IHF-A)
- THD+N (input to PGM) ..... 0.03 % (CCIR-RMS)
- Crosstalk L - R ..... >78dB
- Crosstalk Line1 - Line 2 ..... >75dB

**BCS52S(E)**

**LINE 1 and LINE 2** ..... electronically balanced, 6.3mm stereo jack
- Signal level ..... -14 .. +20 dBm
- Input impedance ..... 10 kohm
- Input noise ..... < 80dB (IHF-A)
- THD+N (input to PGM) ..... 0.02 % (CCIR-RMS)
- Crosstalk L - R ..... >78dB
- Crosstalk Line1 - Line 2 ..... >80dB

**BCS52N(E)**

**LINE 1 and LINE 2** ..... electronically balanced, XLR-F (L1) and 6.3mm st. jack (L2)
- Signal level ..... -14 .. +20 dBm
- Input impedance ..... 10 kohm
- Input noise ..... < 80dB (IHF-A)
- THD+N (input to PGM) ..... 0.02 % (CCIR-RMS)
- Crosstalk L - R ..... >78dB
- Crosstalk Line1 - Line 2 ..... >80dB

**BCS52(S)(N)(E)**

**EQUALISER**
- LOW ..... +/-16dB @ 30 Hz shelving
- MID ..... +/-12dB @ 1.3kHz bell-curve
- HIGH ..... +/-12dB @ 12kHz shelving

## BCS52(N)(S)(E)

**COMMON**
- Frequency range ..... 20... 30kHz @ -3dB
- Balance range ..... -50dB
- Overload indication ..... +18dBm

## BCS53

**PHONE LINE** ..... standard subscriber line, XLR-F (in) and XLR-M (out)
- Signal level ..... -21 .. -0 dBm
- Input impedance ..... 600 ohm

## BCS53T

**TELOS**
- Signal level ..... -15 .. +6 dBm
- Input impedance ..... 10 kohm
- Output impedance ..... 10 kohm

## BCS58

**INPUTS**

**AIR** ..... unbalanced, 6.3mm stereo jack
- Signal level ..... -15 ... +6 dBm
- Input impedance ..... 10 kohm

**SPARE1 and SPARE2** ..... unbalanced, 6.3mm stereo jack
- Signal level ..... 0 dBm
- Input impedance ..... 10 kohm

**TALKBACK** ..... unbalanced, 6.3mm stereo jack
- Signal level ..... 0 dBm
- Input impedance ..... 10 kohm

**PGM INSERT** ..... unbalanced, 6.3mm stereo jack
- Signal level ..... 0 dBm
- Input impedance ..... 10 kohm

**OUTPUTS**

**PGM-L, PGM-R and MONO** ..... electronically balanced, XLR-M
- Signal level ..... +6dBm @ 600 ohm
- Output impedance ..... 600 ohm

**AUD, AUX, PGM1-3, CR, STUDIO** ..... unbalanced stereo, 6.3mm stereo jack
- Signal level ..... 0dBm
- Output impedance ..... 600 ohm

**ANN. and GUEST** ..... headphones, 6.3mm stereo jack
- Power ..... 0.3W @ 4 ohm
- Impedance ..... 3 ... 32 ohm

**EXT. METER** ..... SUB-D-15-F
- Signal level ..... 0dBm
- Output impedance ..... 1 kohm

**PGM INSERT** ..... 6.3mm stereo jack
- Signal level ..... 0dBm
- Output impedance ..... 600 ohm

**ON-AIR1 and ON-AIR2** ..... 6.3mm stereo jack
- Control voltage ..... 12V
- Impedance ..... 1 kohm

**COMMON**
- Overload indication ..... +18dBm
- Output noise ..... <-100dBm (all inputs off)
  <-80dBm (all inputs on)

**SUPPLY**
- Mains input ..... 115Vac or 230Vac; internally switchable
- Power ..... 100VA
- Fuse ..... 2 A slow 5x20mm